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ABSTRACT

This monograph sets forth in detail the concepts included in the five domains of teaching as identified by the Florida Coalition for the Development of a Performance Evaluation System. The first domain, planning, includes the concepts: (1) content coverage; (2) utilization of instructional materials; (3) activity structure; (4) goal focusing; and (5) diagnosis. The second domain, management of student conduct, covers eight concepts: (1) rule explication and monitoring; (2) teacher withitness; (3) overlapping (withitness); (4) quality of desist; (5) group alert; (6) movement smoothness; (7) movement slow-down; and (8) praise. The domain of instructional organization and development consists of the following concepts: (1) efficient use of time; (2) review of subject matter; (3) lesson development; (4) teacher treatment of student talk; (5) teacher academic feedback; and (6) management of seatwork/homework. In the domain of presentation of subject matter, the concepts discussed are presentation of: (1) interpretive knowledge; (2) explanatory knowledge; (3) academic rule knowledge; and (4) value knowledge. The final domain, communication, verbal and noverbal, discusses the concepts: (1) control of discourse; (2) emphasis; (3) task attraction and challenge; (4) speech; and (5) body language. References are included for each domain. (JD)

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DOMAINS OF THE FLORIDA PERFORMANCE MEASUREMENT SYSTEM

Coalition for the Development of a Performance Evaluation System
Office of Teacher Education, Certification, and Inservice Staff Development
Tallahassee, Florida
1983

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Florida Performance Measurement System
Coalition for the Development of
a Performance Evaluation System
Office of Teacher Education, Certification,
and Inservice Staff Development
Tallahassee, Florida

DOMAIN

1.0 PLANNING

1983

1.0 PLANNING

Definition: Planning = preclassroom teacher activities that develop schema for classroom activities.

This domain consists of the following named concepts:

1.1 Content Coverage

1.2 Utilization of Instructional Materials

1.3 Activity Structure

1.4 Goal Focusing

1.5 Diagnosis

PLANNING

Overview

Planning refers to that domain of teaching in which teachers formulate a course of action for carrying out instruction over a school year, a semester, a week or several weeks, a day, or a lesson. Decisions made by teachers as they plan for instruction have an influence on all aspects of their classroom behavior and, consequently, on the nature of the learning outcomes that result from instruction. Teachers' plans serve as "scripts" for carrying out instruction in the classroom. These scripts exert such a strong influence on teachers that they tend not to deviate from them once they have begun teaching. It follows from this that much of a teacher's behavior in the classroom can be predicted by knowing the teacher's script for a particular lesson. For example, the content that will be taught, the materials that will be used for instruction, the activities the students and teacher will engage in during the course of instruction, the way the class will be organized, and much more can be determined from the teacher's plan or script.

Planning not only functions as a means of organizing instruction and a source of confidence, security and direction for the teacher, it can also provide information for the diagnosis and remediation of problems in specific areas of classroom performance. For example, when a teacher is experiencing difficulty in the presentation of subject matter, an examination of the teacher's planning might reveal a lack of attention to the nature of the content to be taught and the unique features of instruction that fit that content. We know from the research on concept teaching that students are more likely to acquire complex concepts if they are provided definitions together with examples and nonexamples. If concepts are to be clearly defined and correct examples and nonexamples provided, then the teacher must give some thought to these matters before instruction begins. More generally, we know that student achievement is higher when the teacher emphasizes during presentation those parts of the subject matter to which the students should give special attention. Unless these parts have been previously identified through a thoughtful analysis of content, it is not likely that the teacher will provide this emphasis during presentation.

While we can state with certainty that planning influences classroom teaching, there are very few correlational or experimental studies of the effects of planning on teacher behavior in the classroom or student achievement. This lack of knowledge about the direct and indirect effects of various teacher planning activities or behaviors precludes the formulation of a research-based prescriptive model of effective planning, at this time. This state of affairs may require some rethinking on the part of those who train teachers and those who supervise and evaluate their performance in the work place. One of the most consistently taught components of the curriculum of teacher education programs is the instructional planning model that includes: (a) specifying behavioral objectives, (b) specifying students' entry behavior (knowledge and skills), (c) selecting and sequencing learning activities so as to move students from entry behavior to objective, and (d) evaluating the outcomes of instruction in order to improve planning. Despite the popularity of this formula, the most definitive thing we have learned from research on planning is that it is consistently not used by teachers in planning instruction.

What we do know from the research that has accumulated thus far is that certain components are consistently present in teacher planning across teachers of various grade levels, subject areas, student populations, and planning or teaching styles. We also have some knowledge of how teachers who are considered to be successful in the classroom deal with these components in their planning -- the kinds of decisions they made within each planning component, the criteria they apply to these decisions, and the way these decisions are organized over several planning levels. These components are concerned with critical elements of the instructional process, including content, materials, activities, goals, and learner needs. Each component is comprised of a set of decisions that the teacher makes relative to a particular instructional element, as outlined below.

In planning, the content component typically includes (1) selection or identification of the subject matter to be taught, (2) the separation of subject matter into distinct elements or parts to be emphasized, (3) determination of the order in which these elements or parts will be taught, (4) a decision about the number of subject matter elements or parts to be taught during a segment of instruction, and (5) a judgment of the appropriateness of the subject matter for a given teaching situation, based on such criteria as learner state, relation to previous and future lessons, curriculum materials and guidelines, or timeliness.

Planning for the use of instructional materials includes (1) selection or identification of the material to be used for instruction, (2) a check of the characteristics of the selected materials, (3) a judgment of the appropriateness of the material for a given teaching situation, and (4) preparation and arrangments to make materials readily available during instruction.

Planning for instructional activities entails (1) identification or selection of the activities which the teacher and students will engage in during a period of instruction, (2) the determination of the order in which these activities will be completed, (3) the specification of the component parts of an activity, including their order, the materials to be used for each part, and the particular roles of the teacher and students, (4) decisions about the amount of time to be spent on a given activity and the number of activities to be completed during a period of instruction, (5) judgment of the appropriateness of the activity for a particular teaching situation, and (6) specification of the organization of the class for the activity. Decisions about the structure of activities are important decisions because activities control the flow of content and materials during instruction. In turn, this flow supports and maintains student attention to the subject matter to be learned.

Reference to goals during planning takes the form of consideration of the general aim or expected outcome(s) of instruction, and includes (1) identification of intended learner outcomes, (2) an examination of the relationship between goals and the planned instruction, and (3) justification of the selected goals in terms of curriculum guidelines.

Attention to learner needs during planning includes (1) identification of that which the students already know or need to know, (2) the matching of learner needs with instructional elements such as content, materials, activities, and goals, and (3) the determination of whether or not students have performed at an acceptable level, following instruction.

Even with this knowledge of major planning components we cannot prescribe a step-by-step formula for instructional planning, since the order of consideration for the various components and the decisions made within each component appears to be variable from teacher to teacher and cyclical in nature, rather than linear. For example, it appears that certain parts of the analysis of content actually occur as the teacher is structuring the activity to be used for instruction, rather than as a part of a planning component that is exclusively concerned with content coverage. Determining the sequence of steps for teaching a skill such as locating a word in the dictionary is a case in point.

Whether there are certain patterns of decision making within these components that are more efficient or effective than other patterns we do not know. The evidence thus far indicates that the inclusion of those distinct decisions within each component is of itself an important factor in planning. In practice, teachers consider planning to be comprehensive and complete when these decisions have been made, regardless of their order. Given the present state of knowledge about effective planning and the pressing need for even a modicum of useful information to help teachers improve their performance in this domain, it is expedient that we make use of this information in a tentative and modest manner.

1.1 Concept: Content coverage

Definition: Content coverage = teacher decisions about the subject matter that is to be taught during a given segment of instruction.

Indicators

1.1.1 Identification/selection of content

Definition: Identification/selection of content = teacher names one or more skills, concepts, facts, rules, principles, laws, or value statements to be taught during a period of instruction.

Examples: Teacher says,

"Definition by context will be discussed."

"The fourth day will be Halloween reading and math. Now, that's the work they will be doing with me, g, and p; so I need to look and see what work they will be expected to complete at their seats by themselves."

1.1.2 Analysis of content

Definition: Analysis of content = teacher separates content to be taught into distinct elements or parts, such as concepts and their exemplars, skills and their sequential steps.

Examples: Teacher says,

"Now, on vocabulary most of these words fall into these two groups, either double consonant or vowel-consonant-vowel." (categorizing content)

"I can use the word gift to teach the ft diagraph."
(selection of illustrative example for concept)

"This will be classifying, using the DLM graduated beads. Now, before we just used the regular beads and they just classified according to shape and color. This time, I'd like to use the graduated beads and just classify once again according to shape and color, and maybe, just maybe, Wednesday I'll introduce size."
(separating a skill into smaller steps)

1.1.3 Evaluation of content

Definition: Evaluation of content = teacher judges appropriateness of content selected for a particular segment of instruction on the basis of specific criteria, such as learner state, proper sequence, timelines, or other factors deemed important.

Examples: Teacher says,

Alright, since this (story) is about the senses, this is going to work in beautifully with our science unit on the five senses."
(criterion = timelines)

"Then, as an extension of this, we can do page 76 in our work book. That falls perfect, they go exactly with what we just did on the group chart."
(criterion = sequence)

"Last week when we did visual discrimination of letters in words, I think the concept they missed the most was first. So I need to work with the concept of first so that they understand first."
(criterion = learner state)

1.1.4 Sequencing of content

Definition: Sequencing of content = teacher decides the order in which subject matter will be taught.

Examples: Teacher says,

"They have to have the concept of first before they can work with beginning consonants, since they have to be able to find the first letter of each word. So that's what I'm going to work on for Tuesday."

"I'm going to put that objective, identifying setting clues, next because on the post test two weeks ago, the children had a difficult time with that, so now is the time to go over the skill."

1.1.5 Pacing of content

Definition: Pacing of content = teacher specifies or refers to the amount of subject matter to be taught during a segment of instruction.

Examples: Teacher says,

"We will finish wh, taking two days."

"Now the story's teacher edition suggests it be divided into two reading lessons, and I'm going to follow that."

"I think that's it; I'm set up for next week. Doing listening comprehension, sequencing for my two top groups. My middle group's going to be doing auditory discrimination, using sound lotto, rhythm instruments, and animal sounds. My low group will be doing classifying. I'm going to introduce big and little, we'll work on color and shape on Friday . . ."

1.2 Concept: Utilization of instructional materials

Definition: Utilization of instructional materials = teacher identification, selection, review, analysis, evaluation, or management of materials to be used for instruction.

Indicators

1.2.1 Identification/selection of materials

Definition: Identification of materials = teacher names specific text pages or other types of materials to be used for instruction.

Examples: Teacher says,

"We will read the Satellite book."

"We will take the post test for Unit 3 that comes with the basal reader."

"I can check with Alec and Shirley and see if they have any materials in those teen magazines they have on Stevie Wonder, since he is blind and he is still living today and maybe the kids would relate to him more."

"What have I got that I can use to teach visual discrimination of big and little? I'm just racking my brains to think what we've got in there that I could use, the beads, buttons . . . . ."

1.2.2 Analysis of instructional material

Definition: Analysis of instructional material = teacher distinguishes characteristics of the material to be used for a given segment of instruction.

Examples: Teacher says,

"There are basically 2 to 4 sentences on the page. The simplicity with which these skills are practiced on the skills sheet make it easy."

"Let's see, every group has at least one game with the story where we play it together in the group. I have found that this visual and auditory learning helps them retain the skill much longer than if we just did it on the board."

"Practice sheet page 55 deals with changing telling sentences to asking sentences by using a question word."

1.2.3 Evaluation of instructional material

Definition: Evaluation of instructional material = teacher judges appropriateness of material for a particular instructional situation on the basis of specified criteria, such as learner state, match with content or format of instruction, time required for completion, availability, or some other factor deemed important.

Examples: Teacher says,

"I don't like the exercise in workbook page 77; I don't think that's good practice. It's simply just filling in with the clusters. So, what I need to do is to go through my file and see if I have any work sheets already made up on these consonant clusters."

"This (workbook page 77) is mostly art work. I don't care for that one too much."

"Now might be a good time to look and see if there is any reinforcement in my workbook. See page 63 and 64 ... and its aim is comprehension on that page, so it really doesn't go along with what this day's lesson is. We'll put that aside, we'll do it later in the week."

1.2.4 Management of instructional material

Definition: Management of instructional material = teacher preparation of materials or arranging to make instructional materials that are to be used for a particular segment of instruction readily available.

Examples: Teacher says,

"I need to be sure that I have my magic markers back in the chalk tray ready to mark these words, and that I have the children's workbook and Holt practice sheet page 76 ready for their activity."

"One set of the vocabulary index cards needs to be placed in the vocabulary center so they can work on this during independent time, free time, and I need to get my chart paper ready and copy the sentences that are found on T. 471, so that we will be ready to fill in with these vocabulary words on Manday's lesson."

1.3 Activity structure

Definition: Activity structure = teacher specifies what she/he and the students are to do during a segment of instruction.

Indicators

1.3.1 Identification/selection of instructional activity

Definition: Identification/selection of instructional activity = teacher states the activity in which she/he or the students will engage for a given period of instructional time.

Examples: Teacher says,

"They will read a play, each one reading a separate part. We will read the play silently, paint a mural, discuss the story. I will introduce the vocabulary words on the board."

"What can I do for seatwork time? Maybe they could write their spelling letter."

"And from that, I can go right into the activity that's on page 482, asking the children what they heard this morning, just using their sense of hearing."

1.3.2 Sequencing of instructional activity

Definition: Sequencing of instructional activity = teacher cites an order or pattern for a series of activities.

Examples: Teacher says,

"When we have finished going over these skills, we will do pp. 43-45."

"We'll have silent guided reading and some oral reading and we'll review paragraph making."

"From the group poem, I want to go right into talking about how some people depend upon their hearing and listening more than others."

"And what we can do is, after we've already gone through these word cards and the children have already identified all of them in sentences, then I can work with this practice sheet, practice ditto. Put dittos as a group activity, and then they can exchange papers and we'll check it."

1.3.3 Analysis of instructional activity

Definition: Analysis of instructional activity = teacher breaks an activity into its component parts, specifying such things as sequential steps, how materials will be used, and teacher/student participation in the activity.

Examples: Teacher says,

"What I need to do is pass the cards out, make sure every child has one, then after we've gone through the words that are on the board, erase those so that they can't use them as their guide, have each one hold their card up, give me the vowel-consonant pattern again, but this time they are going to take some scissors and cut the words into syllables, and then we'll take the two cards, the two halves, and tape them up to the board and, as each does it, I can take the transparency and show it so that they are checking to see if it's correct . . . . "

"Also, this is such a short page, after we finish that I'm going to have them study the words by themselves for a few minutes, then they may get with their partners and call the words out to each other. Then I will have them write their words to see if they know them. The first time we do this, I will call out a word, then they write it and then immediately I write the word on the board and they check their paper, just doing one word at a time."

"We will be working on the first page on the sounds and patterns and then on the second page on the structure and meaning of words. We will go over these together and they will write them by themselves, reading their exercises and doing it. I'll be right there to give them help if they need any."

1.3.4 Pacing of instructional activity

Definition: Pacing of instructional activity = teacher specifies or refers to the amount of time to be spent on an instructional activity or the number of activities to be completed within a given instructional period.

Examples: Teacher says,

"They can be finishing up their skills sheets while I am working with the other group, then I will call their group to read with me."
(managing multiple activities/multiple groups)

"I can assign that (post test) as the first thing . . . . . I can check it and any area that they did not master, I can work with mini groups while they are working on their centers and their enrichment activities."
(Multiple activities/multiple groups for purpose of individualization)

"So, in my book, I'm writing silent reading and interpretation of comprehension, and starting with T. 450, going over to 454, and that should take at least Monday's schedule. I think that would take a half hour to 45 minutes, so I'm not going to schedule anything else for the day."

"So, for Friday we are going to cover one objective, diagraphs, and vocabulary words. And that way, starting the following week, we will be ready to go into our silent reading."
(appropriate stopping place)

1.3.5 Evaluation of instructional activity

Definition: Evaluation of instructional activity = teacher judges the appropriateness of an instructional activity on the basis of specified criteria such as learner state, match with content, instructional format, available time, or other factors deemed important."

Examples: Teacher says,

"I think on the first column of words, as I remember it is always in 3 columns, on the first column, I will call the words out and let them put their accents and then let them do the second ones. Then we will check it and then let them do the third one and then we'll check together right then. I think that will be the best way for them to learn this, rather than doing them all and then by taking up the paper and checking and handing them back."

1.3.6 Specification of activity format

Definition: Specification of activity format = teacher statements that show attention to appropriate organization of the class for instructional activity.

Examples: Teacher says,

"I can assign this as independent work and then they can do the extension on workbook page 77."

"Instead of starting off and having each child divide their paper and each child keep a separate listing, I'm going to do it as a group activity and use chart paper."

"In the other two practice pages, I'm going to make a note for the children to do those by themselves after my introduction. With this practice page 59, I'm going to have . . . . make a notation that we are going to do that together. Alright, after we do that practice page 59, I'm going to assign #6 in the skill sheet for the children to read the directions and do that independently."

1.4 Concept: Goal focusing

Definition: Goal focusing = teacher consideration of general aim or expected outcome of instruction.

Indicators

1.4.1 Identification of expected learner outcome

Definition: Identification of expected learner outcome = teacher states the intended student outcome that should result from instruction, both general and specific.

Examples: Teacher says,

"My goal is to have this group through Level 6 by the end of the year."

"My goal during the first week of school is just to get them to write their first and last name. Many of these children cannot do this when they come to second grade."

"Alright, the first objective in the teacher's edition is identifying and describing exceptions to generalizations about decoding two vowel letters."

"They have always known these are consonant clusters, and I'm trying to teach them that the word *blend* goes along with *consonant cluster*, at the same time."

1.4.2 Evaluation of goal/instruction congruence

Definition: Evaluation of goal/instruction congruence = teacher utterances that relate expected student outcomes to content, instructional activity, teaching-learning materials, instructional format or other instructional elements.

Examples: Teacher says,

"On Monday, they can write their spelling letter to their parents. This teaches them the format of writing a letter . . . . . . "

"So for in the morning, I can take the first objectives, identify the following consonant clusters ft, rk, lk. Alright, teacher's edition, page 482, we are going to do it a little different than what they are suggesting. Instead of just putting the consonant clusters on the board and then going right into the discussion, I think what I'm going to do is get some magazines and try and find some pictures using these clusters."

"So Thursday my aim is going to be to describe onomatopoeia words -- a poetic, I'm going to want a poetic word. T. 427, let's see, pretty much it follows the example there. I think that's something that should be done orally, because they have something together."

1.4.3 Justification of goals

Definition: Justification of goals = teacher gives reason(s) for focusing on specific goals.

Examples: Teacher says,

"And that's what the district guide said they had to do -- three commands."

"Page 4 in the curriculum guide, 'demonstrate listening skill by following two oral directions and by following three oral directions'."

1.5 Concept: Diagnosis

Definition: Diagnosis = teacher statements that focus on student ability or achievement, background, preparation, or needs in the course of planning a segment of instruction.

Indicators

1.5.1 Identification of learner state

Definition: Identification of learner state = teacher utterances that indicate what the learner does know or needs to know, should be able to do, or how the learner should feel.

Examples: Teacher says,

"They understand the concept last, but they need that concept of what's first; and of course they'll need that for the sounds later."

"These two little ones that I've got, they don't know their colors, they don't know their numbers, they can't write their names."

"We will complete workbook page 14 and work sheet 7. We will then go into opposites. We will play a game on opposites and we will complete work sheet page 8. It might seem like this group is doing a lot of skills in a day. They can grasp the skills -- it's the vocabulary they have the difficult time with."

"They have not trouble dividing it into syllables -- any word -- but they do have difficulty in hearing which syllable is stressed. So, I'm sure we will have to make our dittos for practice exercises as a follow-up on that."

1.5.2 Matches learner needs with instructional element(s)

Definition: Matches learner needs with instructional element(s) = teacher statements that relate instructional elements such as content, materials, instructional activity, instructional format, or instructional goals to pupil needs.

Examples: Teacher says,

"If they don't respond well on Wednesday and Thursday, then we won't be doing sequencing in the book Friday."
(matching content pacing to learner state)

"Now, we spent like three or four days on visual memory and I felt like they were getting tired of it. So, I'll just go back and pick it up again, probably after Christmas."
(content coverage on basis of learner state)

"You know, with my other groups I did the graduated beads with size and it was okay, but this group is so slow, I'm really going to have to do something just large and small to begin with and then large, medium and small."

1.5.3 Evaluation of learner end-state

Definition: Evaluation of learner end-state = teacher determines whether or not students have met established criteria for acceptable performance.

Examples: Teacher says,

"They followed ....they followed three commands. Both groups did this successfully. And that's what the district guide said they had to do -- Three commands."

"On Monday, we will take a post test on the last story we finished, called "A Good Place to Play". At the end of this test, I will know whether or not we can go on or we need to go back and review some skills."

"On Wednesday, we will take the post test for "Herman and the Bears" and "Not This Bear". This will give me a little bit of retention -- whether or not they know the skills they learned last week."

Principles

If teachers attend to content, instructional materials, activities, learner needs, and goals in their instructional planning, then the resulting preparedness can increase the probability of effective classroom performance.

If teachers plan, then they experience more confidence, direction, and security in their performance in the classroom.

If teachers attend to elements such as arrangement of the physical setting, selection of basic texts and materials, and familiarity with social and academic development of their students early in the year, then a framework for future planning is established for the year.

Supportive Evidence

Peterson, Marx, and Clark (1978), in a study that related preinstructional planning with teaching behavior in the classroom, found that the number of planning statements dealing with content was consistently related to teacher behaviors categorized as "subject matter focus." Planning statements related to instructional processes were also positively related to teacher behaviors that were targeted toward the whole group. Planning statements dealing with the learner were positively correlated with teacher behaviors classified as group focus. These findings would seem to indicate that teachers carry out their plans in the classroom, once they are made.

Clark and Yinger (1979) report a study which collected elementary teachers' descriptions of the various kinds of planning they do, and the considerations, constraints, and reasons that affect their planning. Responses from the survey indicate that planning functions as a means of organizing instruction and a source of psychological benefits to teachers. McCutcheon (1980) also found that planning functions as a means of organizing instruction and a source of confidence, security and direction for teachers.

Clark and Elmore (1979) conducted a descriptive study of teacher planning during the beginning weeks of the school term in the actual school setting. They found three distinct planning phases, moving from attention to careful organization of the physcial setting, materials and activities prior to the students' arrival through the assessing of student placement and establishing of the behavior structure for the classroom the first two weeks with the students, to the final "settling in" in terms of routines and daily and weekly schedules the third and fourth weeks. The beginning of academic activities also was a part of this period. By the end of October, a framework for planning and teaching for the remainder of the year seemed to have been established.

Earlier studies focusing on the importance of the beginning days and weeks of the school year are: Tickunoff and Ward (1978); Buckley and Cooper (1978); Anderson and Evertson (1978); Schultz and Florio (1979).

Extensions/Exceptions

Clark and Yinger (1979) report a longitudinal case history of plans for five teachers. They note the presence of a cyclical rather than the linear process traditionally used in formal planning. Moreover, the evidence is abundant that teachers do not typically initiate the planning process with a statement of goals and objectives, but with a concern for activities, content, pupil needs, or materials and resources (Clark, 1978; Goodlad, Klein & Associates, 1974; Mann, 1975; Mintz, 1979; Peterson, Marx, and Clark, 1978; Yinger, 1977; Zahorik, 1975; McDonald, 1965; Taylor, 1970; McCutcheon, 1980; Joyce and Harootunian, 1964; Merriman, 1975). Research further shows that objectives and evaluation receive little explicit attention in the planning processes of most teachers; and that when objective statements are made, they tend to come late in the process. (Morine, 1976; Mintz, 1979; McCutcheon, 1980; Peterson, Marx, and Clark, 1978; Taylor, 1970; Eisner, 1967).

Clark and Yinger (1979), in the study already cited, report as one of their findings that written plans usually take the form of an outline or list of topics to be covered, so that the major part of planning remains a mental process not committed to paper. McCutcheon (1980), also studying lesson planning in its natural setting over a school year, found that the written plan is a brief outline of words and phrases that describes what is going to happen in the classroom. The list of topics, concepts, skills and activities serves as a memory jogger to keep the teacher on course.

Planning may in some cases have adverse or unintended consequences. Peterson, Marx, and Clark (1978), working in a laboratory setting, found that a consistent pattern emerged on the second and third days of an experiment in which teachers planned for 90 minutes to teach 55 minute social studies lessons. More teacher planning correlated with 1) poorer student achievement; 2) poorer student attitude toward the teacher, subject matter, and instructional mode; and 3) poorer attitude toward the students on the part of the teacher. Zahorick (1970), analyzed the behaviors of two sets of teachers, both of which had been assigned a particular lesson. One group was supplied with a partial lesson plan, outlining the content to be covered. The other group was not. Analysis of the results showed that teachers who planned exhibited less honest, or authentic use of students' ideas. Zahorik's conclusion was that the objectives-first planning model decreases the teacher's sensitivity to the ideas, thoughts, and actions of the pupils. Peterson, Marx, and Clark (1978) also found that when teachers state objectives in advance, they strive to maintain a lesson focus that will enable them to attain the objectives they have set.

In the study cited above, Peterson et al also discovered that while most planning statements had an effect on the classroom behavior of the teacher, there was little correlation between such statements dealing with the learner and teacher behavior classified as learner focus. Awareness of learner aptitudes during planning apparently translated into a total group awareness in the classrooom rather than attention to individual students.

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DOMAIN

2.0 MANAGEMENT OF STUDENT CONDUCT

1983

2.0 MANAGEMENT OF STUDENT CONDUCT

Definition: This domain = teacher actions that minimize the frequency of disruptive student conduct.

These actions are grouped under the following named concepts:

2.1 Rule Explication and Monitoring

2.2 Teacher Withitness

2.3 Overlapping (Withitness)

2.4 Quality of Desist

2.5 Group Alert

2.6 Movement Smoothness

2.7 Movement Slow-Down

2.8 Praise

OVERVIEW

Management of student conduct consists of at least three types of performance: a) teacher performance that reduces the probability of student disruptions, b) ways of stopping disruptive conduct once it occurs, and c) ways of dealing with serious misconduct rooted in personality aberrations.

We ordinarily do not think of misconduct as being the result of specific teacher actions. Yet research of the last two decades supports the striking fact that much teacher behavior is upsetting to students and definitely increases the amount of student deviancy. The reduction of student misconduct can result from improvement in teacher performance, for example, in ways teachers move groups of students from one location to another, in changing from one activity to another, or in handling concurrent events. Some items in the following pages, based upon research studies, describe teacher performance that can reduce instances of classroom disruptions.

When disruptive conduct does occur, as it will even in the classrooms of the most competent teachers, the effective teacher knows what to do to stop the disruption before it spreads or becomes serious. A teacher who knows how to desist a deviancy not only stops the deviancy but at the same time has a salient effect upon other students in the classroom. Some of the items in the following pages, again based upon research studies, indicate the quality of effective desist techniques.

How to handle chronic cases of deviancy due to personal maladjustment is a question about which there is little classroom research. Except for a few theories and their prescriptions little can be said. The absence of research knowledge is conspicuous. Cases of this type require special attention and the effective teacher knows how to recognize them and to react to them as individual cases. Chronic deviancy does not emerge from group situations or teacher behavior, although these may accentuate the seriousness of the deviancy. While the techniques of handling hard-core cases are not well known, the teacher would do well to recognize these cases and when necessary refer them to counselors. The items in this domain do not explicitly pertain to hard-core cases.

2.1 Concept: Rule Explication and Monitoring

Definition: Rule explication and monitoring = teacher specifies rules of conduct, explains them, provides practice in their use, and consistently checks student conduct by the rules.

Indicators

2.1.1/2.1.2 Rule Specification and Clarification

Definition: Rule specification and clarification = teacher states expectations about student conduct, and illustrates rules (about use of bathroom, when and where to get water, pencil sharpening, use of storage space, etc.)

Example: (Pos.)* Teacher says, We do not litter the halls. She then surmises that "litter" may be a new word to the students and she says, What does 'litter' mean? Jean says, Throwing paper on the floor. Teacher: Yes, and other things. The class then goes on to mention other examples of littering.

2.1.3 Rule Practice

Definition: Rule practice = teacher demonstrates rule and has students perform the behavior denoted by the rule.

Example: (Pos.) Specific procedures for lunch are described and the teacher directs the students in acting out the procedures until everyone knows what to do.

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*"Pos" indicates an example of behavior having a position effect; "Neg" an example having a negative effect.

2.1.4 Rule Monitoring

Definition: Rule monitoring = teacher notes rule infraction and promptly calls on student to desist and calls attention to the violated rule.

Example: (Pos.) Teacher says to Mary who is violating rule about getting a drink: Mary, please be seated. What is our rule about getting a drink?

Principle

If the teacher clearly specifies classroom rules, explains them, provides practice, enforces them and gives positive consequences for compliance, then disruptive behavior will decrease, on-task time will increase, and achievement will increase.

Supportive Evidence

Three studies (Herman and Traymontana, 1971; Advani and Beaumaster, 1973 and Greenwood, et al., 1974) found that setting up specific class rules leads to reduction in disruptive pupil behavior. Anderson, Evertson and Brophy (1979), report that teachers with fewer corrections for misbehavior had higher student achievement. Emmer, Evertson and Anderson (1980), found that teachers identified as being more effective managers had higher average rates of on-task behavior. These differences were most apparent in the areas of classroom rules and procedures, monitoring of pupils, and delivery of consequences.

Extensions/Exceptions

1. Rules alone produce no change in classroom behavior (Madsen, et al., 1968; O'Leary, et al., 1968). Rules plus feedback increased appropriate behavior over 70 percent and rules plus feedback and individual consequences increased appropriate behavior up to 84 percent (Greenwood, et al., 1974).

2. Unless an effort is made to support desirable classroom behavior with appropriate consequences, student behavior will be controlled by others in ways likely to disrupt desired behavior (Thomas, 1968). Thomas found that disruptive behavior increased each time approving teacher behavior was withdrawn. Further, as student behavior deteriorated and teacher disapproving behaviors increased, increases appeared in gross motor noise-making categories of disruptive behavior.

3. Studies at the secondary level (Emmer and Evertson, 1980; Evertson, et al., 1980; Sanford and Evertson, 1981; and Moskowitz and Hayman, 1976) support the need to establish and monitor classroom rules. Academically effective junior high teachers reacted to disruptive behavior immediately. They were predictable and task-oriented. According to Moskowitz and Hayman successful urban teachers took time to establish an orderly classroom environment at the very beginning of the school year. The Sanford and Evertson study emphasizes the need not only to teach rules but to consistently monitor them throughout the year, particularly in low SES classes. The effective manager's rate of inappropriate behavior decreased, while the ineffective teacher's rate went up 50% by the middle of the year and continued to increase. The successful teacher's class mean residual gain in achievement measures was .346 as compared to .027 for the ineffective teacher's class.

2.2 Concept: Teacher Withitness

Definition: Teacher withitness = teacher behavior that indicates to the students that the teacher knows what they are doing.

Indicators:

2.2.1 Deviancy Spread

Definition: Deviancy spread = teacher behavior that stops student deviant conduct before the deviant conduct spreads to other students or becomes more serious.

Example: (Neg.) John whispers to Mary and she giggles. Mary leans over to Bill and whispers. Then Bill and Jane get into the act and Mary giggling, accidentally pushes a book off the table. At this point the teacher desists Bill and Jane, telling them to stop whispering and do their addition problems. If the teacher had caught this chain of events at the start and had desisted John, she would have been acting timely.

2.2.2 Desist Major Deviance

Definition: Desist major deviance = teacher selects the major disruption when two or more deviancies occur simultaneously.

Example: (Pos.) Jim is talking to John, and Mary is listening to the conversation. At the same time two boys in the back of the room are tugging at each other and almost turn over a chair. The teacher desists the two boys, telling them to stop the "horse play" and do their seat work.

2.2.3 Correct Target Desist

Definition: Correct target desist = teacher desists the student who caused the disruption, not a bystander.

Example: (Pos.) Karl sails a paper plane across the room and John, sitting next to Karl, grabs at the plane as it goes by. The teacher ignores John and reprimands Karl.

2.2.4 Alternative Behavior

Definition: Alternative behavior = teacher suggests different behavior to direct a student from deviant behavior.

Example: (Pos.) Mike is whispering to another student. The teacher says: Mike can you continue please--we're on the second paragraph.

Principle

If the teacher demonstrates awareness of disruptive student behavior, selects the correct target, and stops it before it spreads, and offers alternative behaviors, then disruptive student behavior decreases.

Supportive Evidence

In the Kounin studies (1970) in elementary school grades withitness correlated .615 with work involvement and .531 with freedom from deviancy in recitation settings. In seat work settings, withitness correlated .307 with work involvement and .509 with freedom from deviancy. Brophy and Everton (1974) reported positive correlations between withitness and reading achievement in the early grades. Borg (1975; 1975a) has shown that training in withitness techniques reduces disruptions.

Extensions/Exceptions

This set of techniques, according to Kounin (1970) and Kounin and others (1966), applies to boys as well as girls, to emotionally disturbed in the regular classroom as well as non-disturbed children, and to younger and older grade children. They also apply to the group as well as to individuals.

2.3 Concept: Overlapping (withitness)

Definition: Overlapping = teacher attends to a task situation and an extraneous situation occurring at the same time, without becoming immersed in either one alone.

Indicators:

2.3.1 Task-Desist Overlap

Definition: Task-desist overlap = teacher attends to a task and a disruption simultaneously without affecting the on-going task activity.

Example: (Pos.) Teacher is working with a reading group and Jane is reading aloud. Albert, doing seat work, begins to punch at John who is seated ahead of him. The teacher says, Jane, continue reading, and quietly addresses Albert. Albert, I see what you are doing; do your seat work. Then in the same quiet tone says, Jane, you pronounced every word correctly and that was a hard passage.

2.3.2 Task-Intrusion Overlap

Definition: Task-intrusion overlap = teacher attends to two task situations at the same time without upsetting either one.

Example: (Pos.) Teacher is working with a reading circle. Joan is reading aloud, and Henry, who is

> doing seat work, approaches the teacher with his math workbook. The teacher notices Henry, glances at Joan and nods as Joan continues to read. The teacher quietly inspects Henry's work, checks the two problems, and says, Continue. Henry goes back to his seat and Joan continues to read as the teacher says, Joan, you almost mispronounced that word, but you got it right. That's a hard one.

Principle

If the teacher handles overlapping situations without becoming preoccupied with one of them alone, then withitness is enhanced.

Supportive Evidence

Kounin's (1970) study found that overlapping correlated significantly with both freedom from deviancy (.362) and work involvement (.460) in recitation settings and with freedom from deviancy (.379) in seatwork settings. Therefore, both withitness and overlapping are important for effective classroom control, with withitness being of top priority as shown by its higher correlations with student behavior.

The fact that withitness and overlapping also correlate with each other leads to the question of whether either factor is sufficient by itself for successful management. By analyzing the results by means of partial correlations, it was found that although removing the effect of overlapping did decrease the correlations in recitation settings between withitness and freedom from deviancy to .422 and between withitness and work involvement to .477, these correlations remained statistically significant. A similar result was found when removing the effect of overlapping in seatwork settings lowering the correlation between withitness and freedom from deviancy to .380 which is still significant. However, when the effects of withitness were removed from the correlation obtained for overlapping, all of the correlations decreased to insignificant levels (.146 with work involvement in recitation settings, .065 with freedom from deviancy in recitation settings; .107 with freedom from deviancy in seatwork settings).

This suggests that withitness techniques by themselves are more effective in managing student conduct than are overlapping techniques by themselves.

2.4 Concept: Quality of Desist

Definition: Quality of desist = characteristics of teacher behavior emitted to stop disruptive student conduct.

Indicators:

2.4.1 Clarity of Desist

Definition: Clarity of desist = teacher utterance that specifies who the deviant is, what he or she is doing wrong, and why this is improper conduct or what the proper conduct is.

Example: (Pos.) Larry, you are not to grab books from others. Quietly ask Jim for the book.

2.4.2 Firmness of Desist

Definition: Firmness of desist = teacher behavior that indicates that he or she really means that the student's disruptive conduct stop.

Example: (Pos.) Teacher is doing a science demonstration and Don begins to move aimlessly about the room. Teacher says, in a quite determined voice, Don sit down right now, and she looks at him, eye-to-eye, until he is seated.

2.4.3 Roughness of Desist

Definition: Roughness of desist = teacher utterance that expresses impatience and anger, or teacher facial or bodily behavior that expresses anger.

> Example: (Neg.) Ed continues to push other students in line after the teacher has told him to stop. Teacher, in angry voice, tells him to stop and punishes him by sending him back to his seat.

2.4.4 Task-Focus Desist

Definition: Task-focus desist = teacher utterance that directs the student to the task at hand as the desist is given.

> Example: (Pos.) You cannot finish your work unless you stop whispering.

2.4.5 Approval-Focus Desist

Definition: Approval-focus desist = teacher statement that implies his or her warmth toward and feeling for the children.

> Example: (Neg.) To a student, who is standing up looking about the room when he should be doing seat work, the teacher says, "I don't like it when you stand up like that."

Principle

If a teacher uses angry, punitive desists, then the deviant student may stop his or her misconduct but the ripple effect on other students will cause an increase in emotional tension and disruptive conduct.

Supportive Evidence

In two experimental studies on disruptive conduct of exceptional students in a second grade class, O'Leary and others (1970) demonstrate that soft reprimands are more effective in controlling disruptive behavior than loud reprimands and that when soft reprimands are used, fewer are needed.

The most comprehensive study of desist techniques was made by Kounin (1970). He investigated the effect of five dimensions of desists (clarity, firmness, roughness, task-focus, and approval focus), using camp studies, classroom field studies in kindergarten, high school experiments, questionnaire and interview studies, college experiments, and an experimental study (Alden) of upper elementary grades. Here is a summary statement of findings:

Roughness is the only dimension of desist that had a consistent effect in all of the studies conducted. In the kindergarten observations, students who witnessed a punitive or angry desist responded with more behavior disruption than when they observed a desist without roughness. In the high school interview and high school questionnaire studies as well as in the high school experiment, students who observed an angry desist indicated more discomfort than when they observed a desist that wasn't angry in nature. In a study of first-graders, it was found that children whose teachers used punitive desists were more concerned with aggression, less concerned with school matters and showed more conflict about classroom behavior.

Extensions/Exceptions

Alden (Kounin, 1970, p. 51) conducted an experiment involving teacher's warmth and liking for the children and her expertness in the task. The quality of the desists were approval-focus and task-focus. The experiment used fifth graders. The findings show that neither warmth and liking for children nor expertness in the task made any difference in the ripple effect. But desist techniques did make a difference; task-focused techniques resulted in more favorable ripple effect on the conduct of other students than the approval-focus techniques.

In Kounin's high school experiment, it was found that when students witnessed an angry or punitive desist as opposed to a desist without roughness, not only did they feel the most discomfort but they also interpreted the misbehavior as more serious, felt the teacher made too much of the incident, felt there to be greater interference with the lesson and rated the teacher as being most capable of handling a class of tough kids.

When a simple reprimand was observed, students felt the teacher was fairest and able to maintain control of most classes and reported that they paid more attention to the lesson following the incident.

Students who witnessed ignoring used as the desist mechanism rated the teacher highest regarding degree of liking the pupils but felt that the misbehavior was likely to recur.

2.5 Concept: Group Alert

Definition: Group alert = teacher activities that keep students, as a group, focused on the classwork during recitation.

Indicators:

2.5.1 Poses Question, Selects Reciter

Definition: Poses question, selects reciter = teacher asks question before calling on student in order to create suspense and group focus during recitation.

> Example: (Pos.) Teacher asks a question, pauses and looks around before calling on a student, then says, Let's see now, Jim, what's your answer?

2.5.2 Unison Stimulus

Definition: Unison stimulus = students in the class are stimulated to think of an answer to the teacher's question, although only one at a time will be chosen to recite.

> Example: (Pos.) Teacher says, Here is a mind twister; I wonder how many can get it? Teacher states question and looks around while giving students a moment to think. Then the teacher asks the class for a show of hands before calling on a reciter.

2.5.3 Alerts Non-Performers

Definition: Alerts non-performers = teacher cautions nonperformers that they may be called on anytime: if reciter makes a mistake, if answer needs expansion, etc.

> Example: (Pos.) Some students have been silent, taking little or no overt part in the recitation. Teacher says, Each of you should listen carefully, for you may be called on next time.

Principle

If the teacher keeps the group alerted and focused on the lesson by creating a degree of suspense before calling on students to recite, selecting varied strategies for recitation and informing nonperformers they may be called on, then deviant behavior will decrease, and students will become more work involved.

Supportive Evidence

For group alert, Kounin (1970) reports correlations of .603 with work involvement and .442 with freedom from deviancy in recitation settings. In seat work settings, group alert is weakly correlated (.290; $p = .05$) with freedom from deviancy, yet not with work involvement. Kounin found group alert significantly correlated with accountability .494. When the effects of accountability are removed the group alert correlation with work involvement is .475 and .313 with absence of deviancy.

Anderson, Evertson and Brophy (1979) state that, "questioning students is important, choral response should not be overused, and systematic selection of student through ordered turns has positive effects on achievement."

Extensions/Exceptions

This classroom management behavior applies to emotionally disturbed children in regular classrooms as well as non-disturbed children. It applies to boys as well as to girls (Kounin, 1970).

Anderson, Evertson and Brophy (1979) showed the rate per minute on group or choral responses was negatively related to achievement. This same study showed that group call-outs were negatively related to achievement for classes with lower readiness scores. Ordered turns in the same study showed a positive relationship to achievement, while random selection of non-volunteers showed a negative relationship.

Brophy and Putnam (1979) cite studies that showed negative correlations and curvilinear relationships between group alert, accountability and achievement. Providing the teachers stress rules, awareness, overlapping and transitions, there may be less need to use group alert and accountability to manage student conduct.

2.6 Concept: Movement Smoothness (Smoothness = absence of jerkiness)

Definition: Movement smoothness = teacher actions that do not abruptly start, stop, or renew physical or psychological activities of students or abruptly change props--paper, pencils, books, etc.--used in class work.

Indicators:

2.6.1 Reacts To or Interjects Irrelevancies

Definition: Reacts to or interjects irrelevances = teacher is distracted by some unrelated event, object, or idea that comes to mind, and reacts in such a way as to interrupt the on-going class activity.

Example: (Neg.) The teacher is explaining how to work a problem in arithmetic when she happens to note a piece of paper on the floor. She stops and says, Who put that paper on the floor? John did you do that? Pick it up. Now, class pay attention. Then she returns to the problem.

Example: (Neg.) While doing a science demonstration, the teacher suddenly turned and faced the chalkboard said, Look, here are the names of those who did not write up the experiment last time.

2.6.2 Flip-Flop or Dangle

Definition: Flip-flop or dangle = teacher starts an activity, stops it to turn to another, and then returns to the original activity or drops it altogether.

Example: (Neg.) The teacher says, Let's everyone put away our spelling papers and take out our science books. The students begin working science problems. The teacher then asks, Let's see the hands of the ones who got all their spelling words right. How many spelled "receive" correctly? There is a show of hands. The teacher then returns to the science lesson

Example: (Neg.) A teacher says to the class, Look at these sentences on the chalkboard. She turns to go to the board, turns to her desk and starts to look at some papers. After a few seconds, she turns to the sentences on the board.

Principle

If jerkiness in the flow of classroom work is minimized in recitation settings, then disruptive behavior is decreased if momentum is maintained and disruptive behavior is decreased.

Supportive Evidence

Movement management, including both smoothness and momentum, is an important factor in classroom management. Within this area, momentum is more important than maintaining smoothness. Movement management techniques are more highly related to controlling deviant behavior than deviancy management techniques themselves are. Movement management techniques also have the advantage of increasing work involvement, particularly in recitation settings.

In Kounin's study of elementary classrooms (1970), it was found that momentum (the absence of slowdowns) correlates with freedom from deviance in both recitation (.641) and seatwork (.496) settings. Momentum correlates significantly with work involvement in recitation settings (.656) but not in seatwork settings (.198). Momentum by itself is more important for children's behavior in recitation settings than smoothness is when isolated. When the effects of momentum are removed from the smoothness correlations in recitation settings, the correlation of smoothness with freedom from deviancy decreased to .022 and the correlation with work involvement decreases to .222, both of which are statistically nonsignificant.

In seatwork settings, although both momentum and smoothness correlate significantly with children's behavior, when the effects of one of these factors is partialled out, neither correlation remains significant. The correlations found for both momentum and for smoothness in seatwork settings are actually significant due to the combined effects of both factors.

2.7 Concept: Movement Slow-Down

Definition: Movement slow-down = teacher actions that reduce the rate of flow of class activities.

Indicators:

2.7.1 Overdwelling

Definition: Overdwelling = teacher engages in a series of actions or talk beyond what is necessary for students to understand or to know how to participate in an activity, pertaining to conduct, use of materials, or to parts of an activity.

> Example: (Neg.) While beginning a science lesson a teacher exhorts the class, saying, I see some children with their feet in the aisle. Jim, Susan, you two continue to stick your feet in the aisle where others can trip over them and get hurt. Some of the others of you are almost as bad. Now, keep your feet out of the aisle and pay attention to the lesson. Your own feet may get hurt if someone steps on them.

2.7.2 Group Fragmentation

Definition: Group fragmentation = teacher has students do something one by one when the entire class, or sub-groups, could do the same thing collectively.

Example: (Neg.) The teacher signals a group to come to the reading circle. Then she says, Stand. Now, Tom, come up. Then she calls out the name of one student after another, asking each to come forward to the circle.

2.7.3 Prop Fragmentation

Definition: Prop fragmentation = activity is broken into components and the teacher focuses on these sub-parts when the activity could have been carried out as a continuous activity.

Example: (Neg.) Everybody listen. Close your arithmetic books. Put them in your desk. Do not leave them on the top of your desk, keep them out of the way. Now take out your spelling books and put them on the desk in front of you. That's what we want. Keep everything off except your spelling books.

Principle

If slow-down of movement in class activities is avoided in recitations, then disruptive behavior decreases and student involvement in class activities increases. In seat work settings, avoidance of slowdown decreases deviancy but has no effect on work involvement.

In Kounin's study of elementary classrooms (1970), it was found that momentum (the absence of slowdowns) correlates with freedom from deviancy in both recitation (.641) and seatwork (.490) settings. Momentum correlates significantly with work involvement in recitation settings (.656) but not in seatwork settings (.198). Momentum is the highest correlate of effective behavior management in recitation settings.

When the effects of smoothness are partialled out, the correlations between momentum and work involvement and between momentum and freedom from deviancy are lowered to .391 and .476, respectively. These correlations remain statistically significant.

2.8 Concept: Effective Praise

Definition: Effective praise = teacher communication that increase the chances that desirable conduct will be repeated and undesirable conduct eliminated.

Indicators:

2.8.1 Specific Praise

Definition: Specific praise = praise of appropriate conduct of a student who emits contrasting conduct, e.g., out of seat, in seat, pointing out particulars of the conduct or its value, etc.

> Example: (Pos.) John often gets out of line when students line up to move from one place to another. The teacher notes that sometimes John stays in line and praises him for doing so, pointing out the value of his good conduct, e.g., how it helps the group to get to the lunch room earlier.

2.8.2 Praise for Compliance

Definition: Praise for compliance = teacher praises non-deviant or on-task students when another student is disruptive.

> Example: (Pos.) "Jane, can you repeat the question for us? You have been doing a very good job of listening in class." (Lori has not been paying attention and did not hear the question.)

2.8.3 Low-Key Praise

Definition: Low-key praise = praise given unobtrusively and quietly (almost unnoticeable by others).

> Example: (Pos.) Albert is often out of line. On some occasions when he behaves well, the teacher praises him in a low, soft voice or aside.

2.8.4 Conditional Praise

Definition: Conditional praise = praise the student receives only when he or she fulfills a conduct obligation.

> Example: (Pos.) Jim agrees that he should not saunter in the aisle. The teacher praises him when he goes directly to sharpen his pencil and returns to his seat promptly.

2.8.5 Authentic Praise

Definition: Authentic praise = praise that reflects spontaneity, variety, simplicity, warmth, and meaningful content.

> Example: (Pos.) Teacher, in eye-to-eye contact with Bill, tells him that during the week he has spoken out of turn only four times, praises him for his improvement, and suggests that next week he try to do even better.

2.8.6 Teacher Control of Group Praise

Definition: Teacher control of group praise = teacher behavior that reduces group approval of disruptive conduct.

> Example: (Pos.) Almost the entire class laughs when Carl does anything, especially if it is a bit unusual or intended to evoke laughter. The teacher discusses how their behavior, laughing when a student disrupts the class, encourages the student to be inconsiderate and disruptive.

Principle

If the teacher uses praise in the primary grades, even if it is general, noncontingent, or otherwise flawed, then children will be encouraged and their good conduct increased.

If the teacher uses praise in the higher grades and high school, then it will tend to correct misconduct provided it is specific, low key, sincere or used contingently.

Supportive Evidence

Becker and Armstrong (1968) demonstrated that when an elementary teacher was trained to show approval for appropriate behavior, a substantial reduction in disruptive student behavior resulted.

In his review of the research literature on teacher praise, Brophy (1981) points out the weakness in teacher praise as a reinforcer, and discusses the findings of research on frequency and distribution of praise, relation of praise to achievement and student response to praise along with other aspects of praise in the classroom.
Some of the characteristics of effective praise, with regard to the effect of praise on conduct, may be summarized as follows (from Brophy's summary in Table 2):

1. Is delivered contingently.

2. Specifies the particulars of the accomplishment.

3. Shows spontaneity, variety, and other signs of credibility.

4. Rewards attainment of specified performance criteria (which include effort criteria).

5. Provides information to students about their competence or the value of their accomplishments.

6. Uses students own prior accomplishments as the context for describing present accomplishments.*

From Brophy's review of the literature he concludes that praise can not be equated with reinforcement of either student conduct or academic performance. He suggests that "Infrequent but contingent, specific, and credible praise seems more likely to be encouraging--than frequent but trivial or inappropriate praise."

Extensions/Exceptions

Brophy's analysis of the findings of research in terms of attribution theory suggests exceptions and the importance of the student's perception of praise, themselves, and the teacher. The following excerpt from his article states these matters succinctly:

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*Brophy, Jerre. "Teacher Praise: A Functional Analysis," Review of Educational Research, Spring 1981, p. 26. Copyright 1981, American Educational Research Association, Washington, D.C.

Children aged 2 to 7, who are in Piaget's preoperational period, typically introject the evaluative and moralistic statements of parents, teachers, and other authority figures (Kohlberg, 1969). That is, they tend to internalize these statements directly, construing them in a literal and concrete way (to the extent that they understand them), and fail to analyze them carefully to determine whether or not they make sense. With children at this level, even praise that is noncontingent or otherwise defective as specific reinforcement may still function reasonably well as encouragement or more general reinforcement.

However, as children develop reversibility and other concrete operations (Piaget, 1970), and as they come to expect more orderly cause and effect relationships, they come to realize that praise is expected only after certain kinds of behavior (conformity, success), and not others (disobedience, failure). This cognitive development, along with related changes in social-emotional development dealing with the transfer of primary concerns from pleasing authority figures to coping with developmental tasks and handling peer relationships, gradually enables them to begin to reflect on and analyze adults' evaluational and moralistic statements, rather than to simply internalize them as they did in the past.

These principles are illustrated in a series of studies by Meyer, Bachmann, Biermann, Hempelmann, Ploger, and Spiller (1979), who asked people of various ages about the implications of praise, neutral feedback, and criticism following success or failure depicted in vignettes. Adults and high school students attributed low ability to individuals who were praised after success but given neutral feedback after failure, but they attributed high ability to individuals who received neutral feedback after success but criticism after failure. Thus, to the extent that teachers' differential response to different students' performance is noticeable, there is a tendency to infer low ability in sutdents who are "overpraised" and high ability in students of whom teachers are demanding. Meyer et al. showed that the same inferences were drawn when people were asked to imagine that the students in the vignettes were themselves, as well. Their findings did not hold up for elementary school students, however, especially those in the early grades.

Many of these students inferred higher ability in individuals that teachers praised more, even when information about actual accomplishments did not suupport such inferences.

Other recent data also indicate that children in the early grades are not very knowledgeable about either their absolute levels of achievement or how they compare with peers (Nicholls, 1978, 1979a). Thus, the danger that inapropriate praise will backfire is reduced in these grades. Still, it probably is important even for teachers in these grades to learn to praise appropriately, especially when long-run effects stretching across the school year are considered.

With older and more sophisticated students effects of praise will depend on individuals' mediation of the meanings and implications of praise statements. Even identical teacher statements made under the same circumstances and with the same intent (to provide encouragement or reinforcement) may be experienced very differently and may have very different effects in different individuals. Attribution theory (Dweck, Davidson, Nelson, & Enna, 1978; Weiner, 1979) provides a useful framework for analysing some of these effects of individual mediation of praise statements.

Dweck et al. (1978) note that the meaning of praise will be determined by the base rates of frequency of praise following particular behaviors or events, the contingency that is communicated between the praise and some prior behavior or event, and the specific attribution statements made by the teacher (if any). Outcomes (including praise) that simply repeat existing base rates typically are not considered to have important meanings for the individual, compared with outcomes that counter the prevailing trends. Thus, students who are praised under circumstances in which they know everyone gets praised are not likely to attribute the praise to anything special about themselves (the praise is due to the teacher's proclivity for praising certain kinds of behavior). On the other hand, praise that is unexpected is more likely to lead students to conclude that they have done something genuinely praiseworthy.

Praise that is consistently contingent on success will be taken as feedback that success has been achieved. However, if praise is frequently used indiscriminantly in reference to behaviors unrelated to the correctness or quality of the students' responses, the praise becomes ambiguous. Thus, praise from a teacher who consistently praises contingently will cause students to infer that they have done something genuinely praiseworthy (at least in this teacher's eyes), but similar praise from a teacher who does not typically praise contingently may carry no information at all about the objective quality of the students' performance.

Finally, the meaning of evaluative feedback can be influenced by the attribution that the teacher makes when delivering it. Thus, a teacher who praises students' success and tells them that they are smart may teach them to attribute their success to a stable ability factor, but teachers who praise students for working hard enough to succeed will train the students to attribute their success to unstable effort factors.

Dweck et al. (1978) reported interesting sex differences in the kinds of praise and criticism that teachers directed to boys versus girls. The teachers they observed were relatively more likely to praise boys only for objectively successful performance, but to praise girls also for neatness, following instructions to the letter, speaking clearly in addition to merely giving the correct answer, or for other matters of form rather than substance. When making negative evaluations, however, the teachers were likely to criticize girls only for unacceptable performance, but relatively more likely to criticize boys for sloppy handwriting, calling out answers, or other failures to follow the approved form of responding even when the intellectual quality of the response was acceptable. These differences in teacher treatment of the two sexes are not particularly surprising, in view of the well-known differences between the two sexes in adherence to the student role, and they can be defended as appropriate teacher attempts to train the students (particularly the boys) to follow the formal demands of the student role. This training includes, in part, the reinforcement of girls for doing so, which also presumably has the effect of motivating the boys, according to the vicarious reinforcement principle.

However, an attribution analysis revealed that these were not the effects at all. As a result of this differential teacher behavior, the students had learned to make differential attributions concerning the meaning of teacher evaluations. The boys paid serious attention to and apparently were reinforced by teacher praise of their success (the teachers tended to praise them only when they were objectively successful, so that this praise was credible). On the other hand, boys minimized attention to and generally discounted teacher criticism (because too often this criticism was for matters of form rather than substance, and the boys recognized this, at least at some level). One result of this was that the boys attributed their successes to stable, internal ability factors and their failures to stable but external factors (inappropriate teacher attitudes) or internal but unstable facts (their own degree of effort). As a result, they were buoyed up by praise and undisturbed by criticism, and maintained generally positive expectations and self-concepts.

On the other hand, the girls were not particularly reinforced nor encouraged by teacher praise (too much of it was for matters of form rather than substance), but were very discouraged by teacher criticism (the teachers only criticized them when their performance had been inadequate). They tended to attribute their success to external factors (the teachers' inappropriate attitudes or behavior) or to internal factors other than ability (their tendency to follow the formal demands of the theacher and thus to receive praise even when they had not attained objective success). Failures, however, were attributed to stable, internal factors (lack of ability). Thus, despite ostensibly more positive and "reinforcing" treatment, girls were not particularly encouraged by praise, were overly discouraged by criticism, and in general, were less likely to develop positive self-concepts and expectations for achievement.

Finally, the authors also noted that girls occasionally gave clearly incorrect answers and received no feedback about the correctness of their answers but were praised for answering according to the correct form. This was never observed for boys, although boys occasionally got no feedback following a correct answer but were criticized for matters of form. Taken together, these differences in treatment enabled boys to shrug off the effects of failure by attributing it to external factors or to internal factors under their own control (effort), and thus to emerge with high hopes for the future. For girls, however, failure suggested inadequacy; they tried their best (the teacher did not criticize their effort) but they still failed (therefore, the task must be too difficulty for them). This soon led to negative attributions about ability and reduced expectations for future achievement on similar tasks.

This line of research reveals how teachers can undermine their own efforts to encourage or reinforce if they do so inappropriately. The work of Dweck et al. (1978) stressed ther role of attributions and related internal mediations in causing students to discount teacher praise (and criticism). It is also likely that other mediations could cause students to overreact negatively to praise, at least once their thinking becomes operational. That is, when teachers praise certain students too effusively or otherwise inappropriately, especially in response to performance that is not praised in other students, the recipients of the praise might suffer humiliation if they believe that the praise was honestly intended for their own good ("She must really think I'm hopeless if she praises me for that"). Or, they might question the teacher's credibility ("What's the matter with her? How could she think that that was good work?"). Alternatively, the students might reject the praise as overdetermined and manipulative ("He's trying to embarrass me by killing me with kindness while calling attention to my poor work.").

The specific findings of Dweck et al. (1978) concerning student sex differences in attribution patterns and types of evaluative feedback received from teachers do not generalize (Cooper, Burger, & Good, Note 13), but they nicely illustrate how praise can foster counter-productive attributions and behavior. They also suggest guidelines for effective praising, as does other recent attributional research (Bates, 1979; Leeper & Dafoe, 1979; Pittman, Davey, Alafet, Wetherill, & Wirsul, 1980; Blanck, Reis, & Jackson, Note 14; Nichols, Note 15; Ruble, Boggiano, & Pittman, Note 16).

These and other investigators have established that even though praise is a form of extrinsic reinforcement, it can be delivered in ways that do not reduce (and may even increase) intrinsic motivation. This involves following not only the principles derived from social learning/reinforcement theory, but also several other principles designed to see that students maintain a task orientation (Nichols, Note 18) while actually working on the task, and then make endogenous attributions (Kruglanski, 1978) later when reflecting on their experiences.

These guidelines indicate that praise cannot be overused if it is to be used effectively, and that some investment of time and attention to the specifics of performance or conduct of the student is required. The rapid pace of classroom life and the many competing demands on the teacher minimize the availability of such time. To me at least, this seems to underscore the need for teachers to praise well, rather than necessarily often, at least after the early elementary grades.

Teachers can supplement their verbal praise in several ways, however. One is to take time to write specific, informative praise statements on the work they return to students, especially statements that take into account students' expectations for their own performance (Hammer, 1972; Stewart & White, 1976). Another is to help students learn to set appropriate goals (Rosswork, 1977) and to evaluate their own performance (Maehr & Stallings, 1972), supplying self-reinforcement rather than relying solely on the teacher (Glynn, Thomas, & Shee, 1973; McLaughlin, 1976). Attampts to use self-reinforcement with material rewards have not always succeeded (Winston, Torney, & Labbee, 1978), but teaching students to evaluate and (when appropriate) praise themselves for their accomplishments seems well worthwhile. Finally, teachers can teach students to attribute outcomes to their own efforts or ability rather than to external causes (Andrews & Debus, 1978; Chapin & Dyck, 1976; Dweck, 1975).*

*Brophy, Jerre. "Teacher Praise: A Functional Analysis," Review of Educational Research, Spring 1981, pp. 22-25. Copyright 1981, American Educational Research Association, Washington, D.C.

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DOMAIN

3.0 INSTRUCTIONAL ORGANIZATION AND DEVELOPMENT

1983

3.0 INSTRUCTIONAL ORGANIZATION AND DEVELOPMENT

Definition: This domain = teacher performance that provides for conservation of class time, organization and delivery of instruction, and teacher-student interaction.

This domain consists of the following named concepts:

3.1 Efficient Use of Time

3.2 Review of Subject Matter

3.3 Lesson Development

3.4 Teacher Treatment of Student Talk

3.5 Teacher Academic Feedback

3.6 Management of Seatwork/Homework

OVERVIEW

Effective instruction consists of at least three components: efficient use of time, skillful management of the major teaching functions, and skill in conducting classroom interaction. This domain deals with these three components.

Research on time has meaning for us when it is related to what the teacher can do to increase involvement with academic knowledge. Many studies provide information about the amount of time allocated to various subjects, which is surprisingly variable particularly in the elementary schools. Not only quantity of time allowed for a subject, say mathematics, but quantity of time allowed for content categories such as addition and subtraction was found to be widely divergent in the California Beginning Teacher Evaluation Study just as it has been found in every time study over the past sixty years.

Allocated time is not enough. In addition, the teacher must use time efficiently if achievement is to be optimized. The more class time is used in pursuit of academic activities, the greater are the chances that students will be on-task and that the desired learnings will occur. If a teacher delays 10 minutes in beginning class work, students lose one-fourth of a 40 minute period. If a teacher consistently delays the work, students lose at least a period per week or 36 periods in a school year or almost two months. How to reduce off-task time and maximize the amount of time the student spends attending to academic tasks is closely related to the business-like behavior of teachers. It is also related to conduct management. By establishing rules--what to do when you finish your spelling seatwork, e. g., complete the arithmetic worksheet we started last week or finish the story from reading class--the teacher provides a focus on academic tasks and reduces the probability of idle time misbehavior.

Research findings provide knowledge about some factors that can lead to more efficient utilization of class time. Teacher effectiveness studies have verified that effective teachers know how to decrease off-task time including transition time, wait time and time lost through disciplinary action. The items on the following pages focus on what teachers do to increase the amount of time for instruction and to keep students engaged in appropriate tasks.

The major teaching fuctions consist of getting the class underway, providing instruction about what to do, developing the lesson, managing seatwork, homework, practice, and conducting reviews. These functions require teachers to understand the aptitude and achievement of students, appropriateness of subject matter, and the sorts of difficulties students encounter as they try to learn.

It is generally recognized that students must know what they are to do if learning activities are to be effective. But what teachers are to do in order to make sure that students understand what they are to do and how to do it is not so obvious. Here is where recent research has provided know-how. It shows teachers who use techniques that ensure assignments are understood and who hold students responsible for assignments are more likely to be successful than teachers who do not do these things. Likewise skill in conducting different kinds of practice activities is effective, despite the fact that repetitive exercises have been in ill repute in recent years. Systematic reviews, held at appropriate times, are effective teaching operations as is homework when the assignment is challenging but not overwhelming.

Teacher-student interaction has been studied more extensively than any other element of instruction. How to initiate, direct, and sustain interaction requires a variety of skills in asking questions, responding to students, and providing corrective feedback as well as academic praise. Research findings on these aspects of teaching are fairly consistent and in a positive direction, although it must be remembered that, like research findings in all professions, the dependability of the results are contingent upon a number of attendant circumstances.

3.1 Concept: Efficient Use of Time

Definition: Efficient use of time = teacher behavior that maximizes the use of class time for learning.

Indicators

3.1.1 Punctuality

Definition: Punctuality = teacher begins classwork promptly.

Example (Pos.)*: When the school bell rang Ms. Calder was standing at the front of the class ready to begin. She had materials organized, had checked attendance as the students entered the room, and she began the class by maintaining eye contact with students instead of rummaging through her desk for papers, putting up a bulletin board, or otherwise getting organized for the day. Ms. Calder began promptly by stating, Today we will discuss the nervous system of the human body. You will need to take good notes on the lecture in order to use the new terms and their definitions on the diagrams we will be drawing and labeling during the lab period. Let's begin.

3.1.2 Management Transition

Definition: Management transition = teacher shifts from one activity to another in a systematic, academically oriented way.

Example (Pos.): Ms. Henry had the supplies for the art lesson set up before the students arrived. Her class stopped talking as they entered the classroom and each student picked up her/his materials before going to her/his desk.

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*"Pos." indicates an example of behavior having positive effects; "Neg." an example having negative effects.

Example (Neg.): The teacher notices the students were getting restless during seatwork so when they had finished she gave them a break. They stood up and did several exercises. Then she asks them to sit down. She began to arrange papers to be distributed. In the meantime some students began to talk and others wandered about the room. When the teacher had the papers ready for distribution, she had some difficulty in bringing the class to order.

Example (Pos.): Ms. Cody says to the class, When you cut out all of the colors and have them on the color wheel, raise your hand and I'll check them. If they're okay, you can glue them on the wheel. Emilio proceeds to get the scissors, cuts out the colors, places them on the color wheel, and raises his hand.

3.1.3 Wait Time Avoidance

Definition: Wait time avoidance = the teacher organizes the class to keep the lesson moving and provides structure for those students who finish classwork early, thereby eliminating the necessity for students to wait for teacher approval.

Example (Pos.): Ms. Fernandez explains the classroom procedure for arithmetic seatwork. When you finish the first row of problems you may check your answers on the answer sheets that are posted on the board at the back of each row. If you have at least three of the problems answered correctly you may finish the page and put your paper in your folder. Then study your part in the health skit while you are waiting for the class to finish arithmetic. Those of you who miss more than one problem in the first row of examples, raise your hand and I will come to help you as quickly as possible. Ms. Fernandez looks over the class to see if everyone is beginning the assignment; she then moves around the room, monitoring and helping those who are having trouble.

3.1.4 Controlled Interruptions

Definition: Controlled interruptions = teacher enforces rules and procedures to be followed by students who are tardy to class or who do not have their supplies, etc.

Example (Pos.): Mr. Nunez is giving instruction to the class when Maria comes quietly in the room and takes her seat. In her hand is a pass from the office which she places on the right hand corner of her desk for Mr. Nunez to pick up when he is ready. Maria does not interrupt him to ask for the correct page number of the text that he is discussing but instead quietly asks the girl next to her (as previously instructed). Mr. Nunez observes what Maria does to fit into the ongoing lesson without stopping the class.

3.1.5 Housekeeping

Definition: Housekeeping = teacher routinizes activites such as passing papers out, moving to get books, writing on the board, etc., and has materials prepared, procedures worked out, and everything in order.

Example (Pos.): Mr. Perez has papers to return to the class from yesterday. To facilitate passing them out, he has pre-sorted the papers by rows and the first person in each row quickly distributes them. He begins the lesson promptly saying, Today, we will study the Mississippi-Ohio Valley of the United States. To help us learn the important locations of cities, lakes, rivers, etc. in this region, I have some practice exercises on the board which we will find on the wall map. As we discuss the locations, we need also to know why these places are important. After the discussion, we will see a movie on the Mississippi-Ohio Valley to review what we have learned about this region. Mr. Perez has the visual props (pictures and maps) ready to use. The movie is set up to go, and he tested the operation of the machine before the class came in.

Principles

If the teacher is efficient in the use of class time, then students will spend a high proportion of class time engaged in academic tasks and achievement will likely be higher.

Supportive Evidence

Coker (1976) and Stallings (1974) found that effective teachers of primary students spend less class time discussing matters unrelated to lesson content. Brophy and Evertson (1976) also found strong and consistent positive relationships between student engagement in work and learning gains for second and third grade students. Similar findings were obtained by Fisher, Berliner, et al., (BTES, 1978). They found the amount of time students spent engaged in academic tasks in reading and mathematics to be positively associated with learning. On-task behavior of students in approximately 25 classrooms at grade levels two and five were observed and recorded in a field study of effective and less effective teachers. Students in high achieving classes spent less time off-task. In the average classrooms, daydreaming, socializing and misbehaving occupied about eight minutes each hour, but in high achieving classrooms this was reduced by half. Further, wait time between instructional activities was negatively correlated with the student engagement rate in both reading and math in second grade, suggesting that the distraction occurring during wait time transferred to less engagement during subsequent classes. Good and Beckerman (1978) also found that on-task behavior was slightly higher for high achieving students (75%) in their study of six (6) sixth grade classrooms in two schools.

Bloom (1976) reviewed fifteen studies of student attention or participation, finding clear and consistent results for the relationship between engagement and achievement. The correlations of student attention with gain in achievement were about .40 when the student was the unit of analysis and about .52 when the class was the unit.

The effective teacher's use of time in the upper elementary grades is summarized by Medley (1977) as good management and teacher control of classroom activities. Effective teachers present most of the content, keep students on-task, and are less permissive than ineffective teachers. They talk more, but do allow more student-initiated interchanges than those in classes taught by less effective teachers. During seatwork, they attend students less closely, and students are more likely to approach the teacher.

Similar effects from efficient use of time have been found at junior and senior high school levels. In a study of junior high students Evertson (1980) found that low-achieving students were engaged in academic activities only 40% of the time as compared to 85% engaged time for high-achieving students. In mathematics, Good (1980) found that junior high students learned more math in classrooms where teachers were more active in their instruction.

Unfortunately some teachers are not sufficiently interactive. Many general mathematics teachers, in a study of 11 schools, were not very interactive (Stallings and Robertson, 1979) (see Table 1 below); 34% of the time students were told to do written workbook assignments in class. Only 14% of the time was spent in instruction and only 8% of the time in review. The students worked at their own pace and raised their hands to receive help while the teachers graded papers or monitored the class. Some students waited a long time for help or gave up. Students in general math and pre-algebra classes were off-task significantly more often than were students in algebra II, geometry and calculus classes. Teachers in advanced math classes were providing instruction 30% of the time and reviewing 23% of the time. They asked more clarifying questions, e.g. Do you understand? According to Stallings (1981) the most important finding in this research is that teachers need to actively teach for about 50% of the class time.

Fredrick (1977) cited studies in high-achieving secondary schools by Powell and Eash (1974) that showed a positive correlation between achievement and the reduction of the number of disruptions, and used this as one variable in a study of 184 high school classes. Disruptions included anything that halted the progress of the lesson (off-task time). In the high achieving classes 25% of the available on-task time was wasted by interruptions, while in low achieving classes this figure rose to 49%. Other variables including absence rate, tardiness, and completed homework must be considered in the total report.

Table 1*
Percentage of Student Time Spent in Activities
for Three Types of Mathematics Classes*

Variables	Type I	Type II	Type III
Instruction	14.0%	25.0%	30.0%
Review	8.0%	21.0%	23.0%
Written Assignments	34.0%	15.0%	11.0%
Teacher Management/No Students	24.0%	20.0%	15.0%
Social Interactions	11.0%	13.0%	13.0%
Students Uninvolved	11.0%	6.0%	4.0%
Discipline	4.0%	.2%	.05%

Type I - General Math or Pre-Algebra
Type II - Algebra I or Geometry
Type III - Algebra II, Trigonometry, or Calculus

*Some categories are overlapping and the columns will not sum up to 100%

*Reproduced with the permission of Educational Testing Service

Similar findings on the use of time in reading instruction at the secondary level has been reported by Stallings et al. (1978) as follows: organizing/management activities (taking roll, passing out papers, etc.) were 15%; interactive on-task activities (review, instruction, questioning, etc.) were 50%; and non-interactive on-task activities (silent reading, teacher monitoring, etc.) were 35%. Teachers who were more interactive had students who achieved more in reading.

Leinhardt, Zigmond and Cooley (1981) found teachers spent only 16 minutes per day in instructional contacts in reading. Of that time 14 minutes were spent giving general reading instructions, one minute was spent waiting while a student completed a reading task and only one minute per day was spent explaining correct elements of reading. The average off-task rate was 15% while some students were off-task more than 30% of the time.

It is interesting to note that the importance of time utilization is emphasized by a study of English secondary schools. The proportion of the teacher's time actually spent on the lesson topic varied from 65% to 85% on the average in a comparison of secondary schools by Rutter, et al. (1979). A high proportion of subject matter time positively correlated with better student behavior. The less time spent on setting up equipment, handing out papers, etc., the better was student behavior. School averages varied from 2% to 13% of the teacher's time on setting up equipment and behavior was worse when the proportion was high. Student behavior was much better when the teacher prepared the lesson in advance, so that little time was wasted at the beginning by handing out books or in setting up equipment; when the teacher started the lesson on time and when the teacher worked with the class as a whole.

Keeping students engaged in productive activities rather than losing time to writing, moving, getting organized or cleaning up has also been substantiated as effective by Bennett (1978), Gump (1974), and Rutter (1979).

Extensions/Exceptions

In the BTES study, Fisher et al. (1978), found wait time was negatively correlated with student engagement rate in the second grade, but it did not hold for older, fifth grade students, although breaks were negatively correlated for both grades.

In a review of low SES primary level studies, Medley (1977) found that effective teachers used more class time for academic activities. Effective teachers spent more time working with the whole class or large groups and less time with small groups. There was less independent seatwork and less small group work. Less time was spent managing the classrooms. The effective teacher maintained a supportive environment, free from disruptive student behavior, with little apparent effort.

Stallings and Kaskowitz (1974) also found that in low SES primary classrooms, taught by effective teachers, there were more teacher-student interactions related to lesson content and less time in which a child is unoccupied. Time spent attending to reading or mathematics activities yielded higher correlations (.30 to .60) with achievement gain than any of the other coded behaviors or interactions of teachers or students.

Good and Beckerman (1978) reported that a major factor in level of on-task behavior was the type of task. Work involvement in teacher-assigned tasks was 75%, as opposed to 53% for tasks chosen by the student.

Special Note

The concept -- efficient use of time -- entails teacher activities and is relevant indirectly to student on-task behavior. However, the literature review covers not only how teachers use class time but some aspects of research on on-task behavior of students as well. While we are concerned with indicators about how well teachers organize and pursue class work, we recognize that the effect of these indicators is to ensure more time for on-task activity of students. However, on-task behavior does not alone guarantee increased achievement. At least two conditions must accompany on-task activity if it is to be successful. First, the task must not be so simple as to be unchallenging nor so difficult as to be overwhelming. A success rate of 70 to 80% is compatible with research findings. Second, the time required to learn a given assignment is just as important as success rate. The significance of this condition is set forth in the following passage:*

> There is no question that student involvement in learning activity is related to learning (Denham & Lieberman, 1980), but the possibility that there might be limits to the generalizability of the conclusion appears to go unexamined. Carroll's (1963) model, from which this body of work is derived, suggested that student learning is a function of 1) the time required to learn, and 2) time spent learning. The second of these appears to have been the primary focus of recent research, with the first being largely ignored.
>
> Several sets of results suggest qualification of the second element of the model as a function of the first. First, there is evidence of nonlinearity of relations between time on task and achievement gain. The Rim and Coller (1978) reanalysis of the Stallings and Kaskowitz (1974) data (one of the data sets frequently cited in support of time on task) showed nonlinearity such that material declines in student achievement were shown at the higher levels of time on task. The same effect is shown in the Fisher and others (1978) report, although it was not tested. In fact, the highest amount of time on task was most effective when teaching was otherwise least effective. In the analyses of nonlinearity from the Brophy and Evertson (1974) data, the same effect is shown in some instances. While this is hardly a surprising result, neither recommendations to practitioners nor evaluation systems recognize it, so far as we are aware.

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*Soar, R. S., Personal Correspondence

Apparently, for the pupil groups studied in these projects, time on task was sometimes greater than that required for most learning. But that finding for total project groups raises the question of whether some subgroups or objectives may require more time than others. That question has been examined for pupil groups differing in socioeconomic status (SES). Guthrie and others (1976), in a study of 931 reading groups and the styles with which they were taught found that for several reading and vocabulary outcome measures, instructional time was significantly related with achievement for low SES pupils, but "this benefit did not occur for children in middle and high socioeconomic levels." (p. 24) For still another outcome, ". . . smaller gains in reading comprehension were made under conditions of maximum time than under conditions of minimum time for middle and high SES children." (p. 25)

With respect to differences in objectives as they relate to learning time, Soar and Soar (1980) found a measure of pupil task involvement to relate positively with a low cognitive level outcome, but negatively with a high cognitive level outcome. Since there appears to be a degree of parallelism in the effectiveness research literature between teaching styles which are optimal for different SES levels and different cognitive levels, these may be related results.

The concern is that if teachers are evaluated on a straight-line basis by the amount of time their students spend on task, the easiest procedure would be for the teacher to keep the students involved with busy work. The results of several studies suggest that losses occur now, for classrooms in which task engagement is highest, without the pressure of such evaluation. And the losses are greatest for middle and upper ability students and/or for higher cognitive-level outcomes. Pressure from an evaluation system to increase time on task risks being counter-productive.

Research does not indicate a clear-cut procedure for specifying the time required for learning for different pupils and/or objectives, but in that absence, two procedures might be worth exploration: to give teachers the highest evaluation of an intermediate amount of student time on task; or to evaluate negatively for negative affect and disorder (which lower time on task) but not to measure task involvement at all.

3.2 Concept: Review of Subject Matter

Definition: Review of subject matter = teacher performance that either rehearses the main points of a previously discussed topic, problem, unit, or lesson(s) or that directly involves the the class in the rehearsal.

Indicators

3.2.1. Lesson-Initiating Review

Definition: Lesson initiating review = at beginning of a new lesson the teacher either rehearses the previous lesson(s) (daily, weekly, monthly) or involves students in doing so.

Example: (Pos.) Ms. McCray: Let's open our books again to Chapter 10, the chapter we talked about Friday, and do a little bit of review of the week. Remember some of the things that were said that was an introduction to our study that will eventually evolve into the study of man. We divided the animal world into two large groups, the invertebrate and vertebrate. Now we finished our study of the invertebrate group. We discussed some of the characteristics that we had in order to identify the invertebrate group. Let's review that a little bit. Can you give us again some of the things we talked about? We'll outline them on the board. Jane?

3.2.2 Topic Summary Within Lesson

Definition: Topic summary within lesson = a condensation or recapping, by the teacher or students under teacher direction, of the significant points of a preceding discussion as a concluding statement before moving to a new aspect of a topic or problem.

Example: (Pos.) Mr. Howard: In our analysis we found that there are three main theorems regarding similar triangles. Three things that make them similar: angles equal, sides proportional, and an angle of one equal to an angle of the other and the including sides proportional. Now let's see what makes triangles equal.

3.2.3 Lesson-End Review

Definition: Lesson-end review = a restatement (by the teacher or teacher and students) of the content of discussion at the end of a lesson.

Example: (Pos.) The class has finished discussing causes of the Civil War in the United States. The teacher says, Now let's summarize what we have said about the causes of the war. Let's write at this end of the chalkboard the heading 'geographic causes'; on the other end 'political'; and in the middle ' beliefs or moral causes'. Now, let's fill in the major items under each of these . . . .

Principle

If reviews are conducted at the end of the lesson and at weekly intervals (or occasionally longer ones), then retention as well as the amount of learning will be increased.

Supportive Evidence

Wright and Nuthall (1970), reporting on an experiment involving 17 teachers teaching a prescribed lesson in science to third grade students, indicate that review of the previous lesson at the beginning of the new lesson is not clearly related to achievement, but that review at the end of the lesson is positively related to achievement--correlation with mean class residual achievement score being +0.663.

The importance of reviews is underscored by an experimental study conducted by Good and Grouws (1979) to test the effects of an experimental treatment on fourth grade mathematics classes. The treatment was developed from the results of a naturalistic study of a selected sample of forty teachers, twenty-one effective and 19 ineffective as determined by the achievement records of their students over a number of classes. The classroom performance of both groups of teachers was observed. The variables that consistently separated the effective and ineffective teachers were determined and these were integrated with variables found to be positively associated with teacher effectiveness in recent research. The variables thus integrated constituted the experimental teaching design. The key variables are noted in the following table:

Daily Review (first 8 minutes except Mondays)
    (a) review the concepts and skills associated with the homework
    (b) collect and deal with homework assignments
    (c) ask several mental computation exercises
Development (about 20 minutes)
    (a) briefly focus on prerequisite skills and concepts
    (b) focus on meaning and and promoting student understanding by using lively explanations, demonstrations, process explanations, illustrations, etc.
    (c) assess student comprehension
        (1) using process/product questions (active interaction)
        (2) using controlled practice
    (d) repeat and elaborate on the meaning portion as necessary
Seatwork (about 15 minutes)
    (a) provide uninterrupted successful practice
    (b) momentum--keep the ball rolling--get everyone involved, then sustain involvement
    (c) alerting--let students know their work will be checked at end of period
    (d) accountability - check the student's work
Homework Assignment
    (a) assign on a regular basis at the end of each math class except Fridays
    (b) should involve about 15 minutes of work to be done at home
    (c) should include one or two review problems

Special Reviews
- (a) weekly review/maintenance
    - (1) conduct during the first 20 minutes each Monday
    - (2) focus on skills and concepts covered during previous week
- (b) monthly review/maintenance
    - (1) conduct every fourth Monday
    - (2) focus on skills and concepts covered since the last monthly review

It is to be noted that the key variables include a review at the beginning of new lessons and weekly and monthly reviews to sustain daily learning. The treatment teachers were significantly more successful in inducing student achievement than the controls, although the students taught by control teachers also made important gains. This may be attributed in part to the Hawthorne effect that was planned in the project for the control teachers, thus making it more likely that the differences between the control and treatment teachers were due to differences in instruction rather than to the motivation that comes from novel experiences.

Six similiar experimental studies, involving high school and elementary school classes, were examined by Rosenshine (1982). Weekly and monthly reviews were found to be one of the effective instructional functions he identified in these studies. Medley (1977) found in his review of research on teaching that structuring comments at both the beginning and end of a lesson were positively correlated with achievement of kindergarten and first grade students in arithmetic for low as well as high SES students.

Ausubel and Youssef's (1965) study of retention of meaningful prose passages confirms earlier studies by Spitzer (1939) and Reynolds and Glazer (1964) that spaced reviews increase retention more than mere repetition. In a study of the effect of early and delayed reviews (Gay, 1973) on the retention of mathematical rules, involving 53 eighth grade students, it was found that all review groups retained significantly more than groups which were given no review. Furthermore, the comparative effects of early and delayed reviews are interesting. In Gay's words, "The group that received both an early and a late review achieved a higher mean score on delayed retention test than the group that had two early reviews and the group that had two later reviews. The group that received two late reviews retained approximately 20% more than the group with two early reviews; the group with both an early and a late review retained approximately 20% more than the group with two late reviews or approximately 40% more than the group with two early reviews. This suggests that while an early and a late review each have their own unique contribution to make to retention, the contribution of the late review is greater."

In an earlier study by Peterson, Ellis, Toohill, and Kloess (1935), using a passage from history and college students in elementary psychology, it was found that the benefits of reviews were large. Two weeks after the review, the one-review group was 47% better on a test of retention than the group that was given no review; after six weeks they showed a 28% superiority. The group that received two reviews were 75% better after six weeks than the control that received no review. The one-review group, after eighteen weeks, were superior to the controls by 18%, and the two-review group was superior by 57%. A recent experiment by Petros and Hoving (1980) confirms the importance of reviews for retention of prose in eight year old students. Immediate reproduction of the prose passage after exposure significantly affected delayed retention. Also listening to the passage one week later significantly influenced retention compared to the group that received no review.

3.3 Concept: Lesson Development

Definition: Lesson development = teacher activities that keep the lesson moving forward.

Indicators

3.3.1 Lesson Initiation

Definition: Lesson initiation = teacher statement(s) to orient students to the class work and to engage them in academic activities.

Example (Pos.): Mr. McDonald: Today we are going to study the three main classes of rocks. There are rock samples of each class in your lab kit for you to classify as we discuss the characteristics. Let's begin by looking at the sample to see how rocks differ.

3.3.2 Academic Transition Signals

Definition: Academic transition signals = teacher utterance that indicate movement of the lesson from one topic or activity to another by indicating where the lesson is and where it is going.

Example (Pos.): Ms. Soukup: That completes the description of igneous rocks. We will now examine the second group of rocks called sedimentary rocks.

3.3.3 Solo Performance

Definition: Solo performance = teacher activity that gives a clear verbal presentation of some problem or aspect of a lesson, or gives a demonstration with apparatus or informs students by performing as in the dance, playing an instrument, and the like.

Example (Pos.): Ms. McGuire: More than 300 years ago an Italian scientist named Galileo tried an interesting experiment. He dropped stones of different weights from the top of the leaning tower of Pisa. He found that the stones fell toward the earth at the same rate of speed. The weight of the stones made no difference in the speed of their fall.

Since Galileo's time, other scientists have repeated this experiment. They have tried giving objects a sidewise push as they started to fall. They found that the objects still reached the ground at the same time.

They explained these observations as the force of gravity. Even today scientists do not quite understand what gravity is. Gravity is just the name we use for the force that attracts objects to the earth. Gravity keeps us from flying off the earth into space. It is the force that makes raindrops fall and the force that will pull you toward the earth if you climb to a high place and jump off . . . . .

3.3.4 Academic Comprehension Check

Definition: Academic comprehension check = teacher utterances that question individual students or the whole class about the lesson content to ascertain the level of understanding.

Example (Pos.): Mr. Turner: Now that we have studied and classified these rocks, Angus how do you define the term sedimentary rock? Pause. Marie, what change would you make in that definition? Here it is on the chalkboard.

Example (Pos.): Ms. Omori: We looked at words that we often confuse. Give me a pair of words that you think you will remember and use correctly, though they are often confused.
Charles: "Who's" and "whose." Who's, apostrophe s shows possession.
Teacher: Correction, Kenny.
Kenny: That would mean "who is." It is shortened by deleting the

"i." It is a contraction.
(Practice continues with "whether" and "weather," "there" and "their," "principle" and "principal," "accept" and "except," "quiet" and "quite," and so on.)

3.3.5 Low Order Questions

Definition: Low order questions = teacher questions that require the student to use information such as facts, definitions, names, and the like (student is not asked to give evidence to support his/her answer)

Example (Pos): The election of 1896 is being discussed in a history class. The teacher says, William Jennings Bryan--from which state of the Union did he come at this particular time?
Nancy: He represented Nebraska.
Teacher: Do you remember where he was born?
Nancy: No. Wisconsin?
Teacher: No. Much nearer to the area he represented.
Mary?
Mary: Illinois.
Teacher: He was born in Salem, Illinois.

3.3.6 High Order Questions

Definition: High order questions = teacher questions that require the student to explain, compare and contrast, evaluate, justify, and the like (student gives evidence or is asked to give evidence to support his/her answer)

Example (Pos): In a biology class the teacher asks, How do you suppose the fish separates the food from the water. They take it into their mouth and they push the water over their gills in order to get the oxygen. How do you suppose this fish gets anything to eat? Student: Well, when he swallows the water, these gill rakers--well, most of the water goes back out the operculum. Well, the gill rakers filter out all the dirt and the rest of the matter goes on into his stomach--and he doesn't have teeth--I mean chewing teeth. He just holds them and he has stomach acids which dissolve the food material.

3.3.7 Nonacademic Questions

Definition: Nonacademic questions = teacher questions for which almost any answer is acceptable, e.g., those that ask for personal opinions or personal experiences.

Example (Neg): The class is discussing a story written by a member of the class. The teacher asks: What would be a good title?

Example (Neg): After discussing how Hamlet might have felt in his famous soliloguy, the teacher asks the class: Did you ever feel like that?

3.3.8 Congruence of Answer

Definition: Congruence of answer = answer given to the teacher's question is either correct or approximately so.

Example (Pos.): Mr. Cumbu: Is it fair for an author to use emotional appeal to promote his argument?
Lydia: It definitely is, because if what you say does not appeal, and if you can't get people interested in emotion, then you can't promote a cause.

3.3.9 Choral Practice

Definition: Choral practice = a form of practice where members of the class repeat examples of the task or psychomotor activities in unison.

Example (Pos.): Ms. Sanchez: A new sound we learned today was long a, a. Let's all say the long "a" sound together.
Class: a
Ms. Sanchez: Let's practice the long "a" sound in some of our vocabulary words. Say the words in the first list on the board as I point to them. Altogether now --
Class: bake say tail
take hay sail
lake may mail

3.3.10 Pause Following a Question

Definition: Pause following a question = the teacher asks a content question, then pauses before saying anything more and before soliciting an answer.

Example (Pos.): Mr. Solomon: What is the topic sentence in the first paragraph? (Wait) Kim?
Kim: It's the first sentence: "Unlike Latin, which has six tense forms, English has only two -- present and past."
Mr. Solomon: Right. Is the topic sentence always first? (Wait) Amy?
Amy: No, sometimes it is at the end.
Mr. Solomon: Can you find a paragraph where the topic sentence is not the first sentence: (Wait)

Principles:

If the teacher begins lessons by providing orientation and direction and sustains the lesson momentum by providing clear explanations, checking for student comprehension of explanations, maintaining direction by transitions from one part of the lesson to another and providing practice in unison where it is appropriate, then learning will be increased.

If low order questions are used by teachers of low SES students, then achievement is likely to be higher than if high order questions are used.

Supportive Evidence

The pioneer work of Bellack (1966) on classroom discourse and Ausubel's work on advance organizers (1960) opened up anew the question of lesson structuring as a way of initiating a lesson and sustaining it. The mere making of book or lesson assignments -- read so many pages, work so may problems, and the like -- was, by implication, called into question.

Telling students in advance the general framework of the lesson, or giving them some of the main ideas on which to relate subsequent learnings, is said to facilitate learning. Or again, stating objectives at the lesson's beginning and outlining the lesson content constitute an overview that facilitates study and achievement. These are approaches to lesson development. What does research say?

Consider objectives as an approach. Instead of reciting the results of scores of studies, some providing evidence in support of behavioral objectives and other presenting contrary evidence, it seems more appropriate to quote the opinion of two extensive reviews of the research literature, one by Duchastel and Merrill (1973) the other by Melton (1978).

As a general summary of their findings, Duchastel and Merrill make the following observations:

> "Results obtained from the research which simply addressed the general issue are, to say the least, inconsistent. Studies which

> have found no significant differences between experimental and control groups are as numerous as those which have found such a difference. Furthermore, when we consider the total number of studies which have investigated effects on student achievement, an even smaller proportion of studies have found a significant main effect for this variable. However, those studies which have found such an effect have usually favored the presentation of objectives (the one exception is the Yelon and Schmidt (1971) study). A further difficulty in interpretation arises in those studies which have found different results between immediate learning and retention."
>
> "Within this overall picture, we have looked at three factors which could have perhaps accounted for the discrepancies. The first of these is the topic or subject matter used in the learning materials. Topics ranged from the physical sciences to the social sciences, but this factor did not seem to bring any more consistency to the results. The second factor we looked at was level of schooling. Here again, it did not seem to matter whether the study was conducted with primary, secondary, college, or adult learners. Neither did the time factor seem to bring any more clarity to the results: positive findings were found with a 10-minute instructional period just as with instruction ranging over many weeks. It is difficult to say at this time whether any other characteristics may be at play and could possibly clarify the situation."
>
> "Type of learning, a variable which has been investigated in a number of studies, seems to contribute little to an explanation of the phenomenon. Also, the investigation of learning time as a factor has resulted in ambiguous findings. On the other hand, a number of individual differences have been found to interact with objectives, pointing to the need to restrict any generalizations."

Melton (1978) concluded, as did Duchastel and Merrill (1973), that studies of the effects of behavioral objectives on student achievement do not provide us with consistent findings. As he says, "It is clear that behavioral objectives can enhance relevant learning, but in a number of studies may fail to do so, even though other variables have been carefully controlled by the nature of the experimental designs involved."

Anyone who is familiar with the large number of studies will readily see that their findings are inconsistent but that the studies themselves do not contradict one another. They are not contradictory because they are different studies, involving different variables. There is no agreed upon definition of objectives generalizable across studies; the criterion of clarity of objectives for students varies among the studies; the difficulty of the objectives is not the same from study to study; and the inclination of students toward school work and achievement is seldom considered.

What can we say about the use of behavioral objectives as a way of initiating a lesson? For one thing, no research indicates that the use of behavioral objectives has a negative effect on learning. For another thing, it is a matter of professional experience that students are likely to achieve more when they know what they are expected to learn no matter how they are informed -- by simple statements of purpose, by statements about what they are to study, by specific objectives, or by behavioral objectives. There is little support in the research for concise behavioral statements of objectives as advocated by Mager (1962).

Another mode of initiating a lesson is structuring. While structuring can and usually is done throughout a lesson, at the beginning of a lesson it consists of providing a context within which the lesson is to be developed. This can be done in a number of ways. One of the most widely known ways is called advance organizers, conceptualized and tested by Ausubel (1960).

The research on advance organizers is extensive, some studies supporting the efficacy of organizers while others find them unrelated to achievement. The most comprehensive digest of research on advance organizers is a meta-analysis of 135 studies (published and unpublished) by Luiten and others (1980). Advance organizers were found to have a facilitative effect on both learning and retention. Effects on learning were greater for college and special education students than for primary and secondary students, but the reverse was true for retention. In general, it appears that introducing lessons and conducting them in the framework of a brief overview of the information to be studied before new subject matter is presented has a small but positive effect on learning and retention.

Wright and Nuthall (1970) found that the amount of teacher structuring--discourse that sets the context for subsequent study-discussion--is not related to student achievement. But Furst (1967) found from a reanalysis of data collected by Bellack and others (1966) that neither high nor low structuring affected achievement as well as moderate structuring. This finding is consistent with the work of Soar and Soar (1979). These authorities found, at least in the elementary grades, that the teacher can either understructure or overstructure task activities as well as student thinking. Their observations are as follows:

> "In most research on classroom behavior to date, the analysis has used product-moment (linear) correlations, which assume that, if some of a behavior is good, more is better. Since it does not seem reasonable that the "more is better" assumption should fit all classroom behavior, nonlinear relations were also calculated for some measures in all our studies. In general, the nonlinear relations seem to amplify the conclusions that were reached from the linear relations. In the area of teacher management of learning tasks, from study FT 1, the relation between a measure of "drill (versus pupil initiation)" and gain in achievement was represented by a curve in the form of an inverted "U." Beginning with the least amount of drill, gain tended to increase as drill increased. But at a point approximately midway through the range of teacher behavior, increases in gain leveled off, and, as drill increased even more, the curve fell more and more sharply. Most gain was associated with a moderate amount of drill, as shown by an "M" in the table, rather than with higher or lower amounts. A measure of "teacher-directed (versus

pupil-selected) activity" from the same study was related to gain in the same way, indicating that most gain occurred with a balance between direction by teachers and freedom of pupils. The similar nonlinear relation between recitation and three measures of achievement from study Fla 5 has already been cited, and the similarity between the activities of drill and recitation should be noted. Moderate amounts of either were associated with greatest pupil gain.

"In the area of teacher management of thinking, from study SC 3-6, the same measure of indirect teacher interaction that was related in linear fashion to gain in creativity was also related in nonlinear form to both vocabulary and reading. In study Fla 1, the measure of "teacher-pupil translation," the second lowest cognitive level, was related similarly to two readiness measures. These nonlinear relationships for measures that were classified under both management of learning tasks and thinking support the conclusion reached earlier for learning tasks--an intermediate amount of teacher control and pupil freedom was associated with greatest learning.

"In addition to these findings of nonlinearity, there were indications that the curves were different for different outcome measures. The differences were consistent with the interpretation that greater amounts of pupil freedom were functional for complex, high cognitive-level learning objectives, but lesser amounts of pupil freedom were functional for simpler, low cognitive-level outcomes. The results suggest that when the teacher is concerned with pupils' memory for facts, such as the multiplication table, spelling or dates in history-certainly necessary goals-a highly focused drill session that gives pupils little freedom in learning task or thinking will result in most learning. But when the teacher is concerned with more complex objectives, such as understanding arithmetic operations, solving complex problems, organizing ideas in writing, or generalizing historical relationships to the future, then more freedom for pupils in exploring ideas and carrying out the task is functional. But even here a certain amount of teacher management is necessary, and the results suggest that many teachers fail to supply that amount.

> "But these are minor variations on the more general conclusion that teacher management of learning tasks and thinking in which the teacher selects and directs activities, yet permits a degree of freedom for pupils, is more functional for learning than either greater or lesser amounts of teacher direction and control."*

It should be noted that while research indicates that the amount of structuring consistent with optimal learning is partly contingent on the nature of the subject matter, there can be too much or too little structuring especially when the subject matter is cognitive. It is to be noted also that points of diminishing return for neither structuring nor non-structuring have been determined so that the optimum amount of either comes down to a matter of experience and judgment.

Once the lesson is underway it is further developed by questions, explanations, checking understanding, making transitions from one topic to another, and sometimes engaging in choral practice.

It is well established that teachers who explain difficult points and analyze problems clearly are more effective than those who do not (Good and Grouws, 1977; Kennedy, Cruickshank, Bush, and Myers, 1979).

Giving transition signals is associated with achievement through the process of structuring. To keep students informed about the course of lesson development is to help them remember what has been discussed, developed, or practiced and to smooth the path to the lesson's next phase.

First of all, what are high and low level questions? Dunkin and Biddle (1974) suggest a way to identify them. They compared the categories of cognitive operations of Smith, Meux, et al. (1962) with those of Bellack et al. (1966) with respect to low and high cognitive questions. The results of their analysis are shown in the following table:

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*From Research on Teaching, by P. L. Peterson and H. Walberg, page 115-116, McCutchan Publishing Corporation C 1979. Permission granted by the publisher.

Proposed relationships among categories of the Illinois and Columbia Instruments.

Tisher	Illinois Logic Instrument	Columbia Instrument	Bellack-Furst
		Interpreting	
	Defining	Defining--general	
Lower		--connotative	Analytic
Cognitive	Designating	Defining--denotative	
Demands	Describing		
	Stating	Fact Stating	
	Reporting		
	Explaining--sequential		
			Empirical
	Comparing and contrasting		
	Conditional inferring		
	Explaining--mechanical	Explaining	
	--causal		
Higher	Explaining--normative		
Cognitive	--teleological	Justifying	
Demands	Evaluating		Evaluative
	Opining	Opining	
	Classifying		
	Substituting		
	Explaining--procedural		

The two category ssystems compared by Dunkin and Biddle are as follows:

Entry categories of the Illinois logic instrument. (Adapted from Smith and Meux, 1962, pp. 36 ff and Appendix 3, and from Nuthall and Lawrence, 1965, p.6)

DEFINING: The meaning of words or terms is asked for, implicitly or explicitly; e.g., "What is the definition of 'felony'?" "What is a cablegram?" "What does this mean?"

DESCRIBING: An account of something which has been mentioned or suggested is required; e.g., "Can you tell us something about the schools of New Zealand?" "Where is Singapore?" "What do you notice about the fish in the aquarium?"

DESIGNATING: Something has to be identified by name--a word or a symbol; e.g., "Give an example of a substance which dissolves in water." "Can you recall the name of the hero?" "Which word is to be modified?"

STATING: Names, descriptions, etc., are not asked for, but statements of issues, steps in a proof, rules, conclusions, or a state of affairs. For example, the question, "What is the conclusion?" asks for a statement of some sort; it can seldom be answered satisfactorily merely by naming. "What is the next thing to do in solving the problem?" "What is the formula for the area of a square?" "What answer did you get?"

REPORTING: A request is made for a report to be given on information contained in some source such as a textbook, or for a review or summary of this information; e.g., "Did your book say anything about the Indians?"

SUBSTITUTING: The student is asked to perform a symbolic operation, usually of a mathematical nature; e.g., "Multiply it." "Simplify this equation."

EVALUATING: An evaluation of an object, person, expression, event, action, or state of affairs is required; e.g., "Was the strike a sensible thing?" "Do you think that silicon is very valuable in industry?" "Is it a good book?"

OPINING: The student is required to express his belief or opinion about what is possible, what might have been the case, what could be in the future, etc. He makes an inference from evidence rather than a report of a single fact; e.g., "Do you think Napoleon would favour present French foreign policies?" "Does a fish have to live in water?" "What will the next generation think about our methods of transport?"

CLASSIFYING: Explicit reference is made to an instance or class (type, sort, group, set, kind) of things or both. A given instance is to be put in the class to which it belongs, or a given class is to be placed in a larger class; e.g., "What special type of triangle is this?" "What group of animals does the jellyfish belong to?"

COMPARING AND CONTRASTING: This type of initiating statement is usually marked by the presence of such words as "difference between," "differ from," "be different," "compare," "like," "correspond"; e.g., "What do they (words on the board) have in common?" "Is the state the same as the government?" "Would a quail be something like a partridge?"

CONDITIONAL INFERRING: A prior condition is given and a consequence is asked for, or both the prior condition and the consequence are given and the student is asked to affirm or deny the prior condition; e.g. "If they (two lines) are parallel, then what is the altitude of the two triangles?" "If you have a car and do fifty miles an hour for three hours, how far do you go?" "Is he a good judge if he sentences the man to hanging?" (within the context of the story).

EXPLAINING: Initiating statements in this category give a consequence of some kind and require that the appropriate prior condition be given, or they require that some general rule or set of conditions be given which explains why a certain prior condition is followed by a certain consequence.

There are six subcategories:

MECHANICAL EXPLAINING: An event or action is to be accounted for by describing the way the parts of a structure fit together; e.g., "How do fish make a sound?"

CAUSAL EXPLAINING: An event, situation, or state is to be accounted for by citing another event (situation, or state) as its cause, e.g., "What makes a person's muscles sort of twitch-like?"

SEQUENT EXPLAINING: A sequence of events is to be cited of which a given event is the sequel; e.g., "How did McKinley happen to be killed?"

PROCEDURAL EXPLAINING: Steps or operations by which a given result or end is attained are to be described; e.g., "How did you get 72 for an answer?"

TELEOLOGICAL EXPLAINING: Actions, decisions, states of affairs, or values are to be justified by reference to purposes, functions, or goals; e.g., "Why are you doing those problems?"

NORMATIVE EXPLAINING: Actions, decisions, or choices are to be justified by citing a definition, a characteristic, or rule; e.g., "Why do we call them the Chordata animal group?" "Why do we use shorter pencils?"

DIRECTING AND MANAGING CLASSROOM: Many entries have little or no logical significance. They are designed not to evoke thought but to keep the classroom activities moving along.

Categories for substantive logic in the Columbia Instrument. (Adapted from Bellack et al., 1966, p. 22 ff)

- 2.1 Analytic Process. Analytic statements are statements about the proposed use of language. They are true by virtue of the meaning of the words of which they are composed.
  - 2.11 Defining--General (DEF). To define in a general manner is to give a specific example of an item within the class. DEF is also coded when the type of definition asked for or given is not clear. Example: T: What is a barrier? P: It's something that hinders trade, like a tariff.
  - 2.111 Defining--Denotative (DED). To define denotatively is to refer to the objects (abstract or concrete) to which the term is applicable. Example: T: What are public utilities? P: Light, power, gas, water.
  - 2.112 Defining--Connotative (DEC). To definite connotatively is to give the set of properties or characteristics that an object (abstract or concrete) must have for the term to be applicable. DEC thus refers to the defining characteristics of a given term. Example: T: Now what do we mean by quotas? P: The government sets a special amount of things that can come into the country in one year, and no more can come in.
  - 2.12 Interpreting (INT). To interpret a statement is to give its verbal equivalent, usually for the purpose of rendering its meaning clear. Example: T: What does President Kennedy mean when he says, "We must trade or fade?"
- 2.2 Empirical Process. Empirical statements give information about the world, based on one's experience of it. The distinguishing mark of empirical statements is that they are verified by tests conducted in terms of one's experience.
  - 2.21 Fact-Stating (FAC). Fact stating is giving an account, description, or report of an event or state of affairs. To state a fact is to state what is, what was in the past, or what will be in the future. Example: T: Now in 1934...in 1934...who was President? P: Roosevelt.

2.22 Explaining (XPL). To explain is to relate an object, event, action, or state of affairs to some other object, event, action, or state of affairs; or to show the relation between an event or state of affairs and a principle or generalization; or to state the relationships between principles or generalizations. Example: T: Why do industrialized countries trade the most? P: Because they have more...more to offer each other.

2.3 Evaluative Process. Evaluative statements are statements that grade, praise, blame, commend, or criticize something. Evaluative statements are verified by reference to a set of criteria or principles of judgment.

2.31 Opining (OPN). To opine is to make statements in which the speaker gives his own valuation regarding (a) what should or ought to be done, or (b) fairness, worth, importance, or quality of an action, event, person, idea, plan, or policy. Example: P: I think the farmer is being exploited.

2.32 Justifying (JUS). To justify is to give reasons for holding an opinion regarding (a) what should or ought to be done, or (b) fairness, worth, importance, or quality of an action, event, policy, idea, plan, or thing. Example: P: I feel that the reason why the United States should not and probably will not in a number of years join the Common Market is that because the Latin countries with which we are associated would feel that we are no longer interested in their opinion.

2.4 Not Clear (NCL). When the wording or sense of a statement is ambiguous and the substantive-logical meaning cannot be determined the logical process is coded NCL.

The Bloom Taxonomy is also used to distinguish high and low order questions. Here is Dunkin and Biddle's (1974) adaptation of it.

1.00 Knowledge
  1.10 Knowledge of specifics
  1.20 Knowledge of ways and means of dealing with specifics
  1.30 Knowledge of the universals and abstractions in a field
2.00 Comprehension
  2.10 Translation
  2.20 Interpretation
  2.30 Extrapolation
3.00 Application
4.00 Analysis
  4.10 Analysis of elements
  4.20 Analysis of relationships
  4.30 Analysis of organizational principles
5.00 Synthesis
  5.10 Production of a unique communication
  5.20 Production of a plan, or proposed set of operations
  5.30 Derivation of a set of abstract relations
6.00 Evaluation
  6.10 Judgments in terms of internal evidence
  6.20 Judgments in terms of external criteria

Questions that fall in categories 1.00 and 2.00 are said to be at a low cognitive level.

Do the effects of different kinds of questions vary with grade levels or with the student SES? Medley (1977) compiled a bibliography of 732 items of original studies. By the application of rigorous criteria this list was ultimately reduced to fourteen studies. From his analysis of the effects of low level questions upon achievement, as shown in these studies, he reports that "We have consistent evidence from four different studies that effective teachers of low SES pupils ask more questions classifiable in the lower levels of the Bloom taxonomy than ineffective teachers do. This difference holds no matter how teacher effectiveness is defined--whether in terms of high or low complexity outcomes in arithmetic or in reading. A fifth study suggests that effective teachers of low SES students ask fewer choice questions--that is questions which offer a limited choice of answers. The general conclusion that effective teachers prefer low level questions seems justified despite this one somewhat inconsistent finding." Then he points out that "evidence that effective teachers also ask fewer high level questions is less extensive, but the results from three studies agree."

The students used in these studies were mainly from the kindergarten and primary grades. The relation between cognitive level of questions and student achievement in the upper grades and secondary school has received little attention by researchers. Furthermore, few studies have been made of the relation between the cognitive level of questions and content fields--science, social studies, and English. A study by Tisher in Australia (Dunkin and Biddle 1974) in science suggests that the use of fewer high cognitive questions was associated with higher achievement for pupils of low ability and that moderate use of such questions was associated with gains for high ability students.

However, data correlated with residualized student achievement gain scores averaged over four years, produced a pattern of different optimal question difficulty levels for high SES as opposed to low SES elementary students. This effectiveness study by Crawford et al (1975) indicated that learning is improved when teacher questions are relatively easy to assimilate. Optimal levels of question difficulty were around 75% of the questions answered correctly. At lower levels of error rate material was too difficult and frustrating to assimilate; higher levels, called errorless learning, did not involve challenge and failed to prompt reasoning and thinking.

The more successful teachers in the low SES classes taught at the level of skill practice and factual memory. They moved at a slow pace and spent much time teaching and reteaching the basic fundamentals of reading, writing and arithmetic.

In contrast, the questioning level of difficulty utilized by the more successful high SES teachers included problem solving, and application of skills. They worked at a faster pace and introduced more variety in their teaching methods and materials.

If the teacher is available to interact with students in group lessons or individually, then it is possible and desirable to present more challenging and more difficult material. The higher the ability and knowledge level of the learners, the more difficult the task can become without losing effectiveness. Less able students need material in smaller steps and with greater repetition to the point of overlearning. This generalization held true in a replication study by Crawford (1975) with college students working independently.

Much research remains to be done on this important question. We do not know how the effect of the cognitive level of questions is conditioned by the nature of the subject matter or by the student's level of development. Nor do we know whether the problem is in the ability of teachers to formulate clear high level questions or in the nature of the questions themselves, although a recent study sheds some light on the problem (Mills, Rice, Berliner, Rosseau 1980). As Dunkin and Biddle (1974) suggest "It may not be the high level quality as such that is the problem. As we saw,...one fault noted....with high level, explaining-type questions is that they were often vaguely expressed. Could it be, then, that when teachers ask higher level questions vagueness often enters and interferes with the communication to pupils? Wright and Nuthall (1970) provided some support for this possibility when they found a high positive correlation (r = .75) between frequency of closed (lower-level) questions and teachers avoiding the repetition of questions. The explanation for this finding might be that low-level questions can be phrased with less vagueness and, therefore, with less need for repetition."

Might it also be that low achievement from high level questions is associated with the failure of teachers to insist on correct answers. The chances that the answers will be congruent with the questions are about fifty-fifty (Mills, Rice, Berliner, Rosseau 1980). Or could it be as Rosenshine (1979) suggests, that there is confusion about what is meant by the expression "high-level cognitive questions"?

> "Questions that require a student to search the text and make inferences (for example, "What words tell you that Mary felt sad?") are frequently coded as "lower-order" because they have a single answer to be taken from the text, whereas questions of opinion (for example, "How do you think Mary felt?") are frequently coded as "higher-level" because they have more than one possible answer, although none of those answers is found in the text. Therefore, the inferential, lower-level questions, which require searching the texts, may be more representative of academically engaged time.
>
> "Many questions coded as "higher-level" may really be personal questions and questions about opinions. In the studies by Stallings and Kaskowitz, by Soar, and by Brophy and Evertson, open-ended questions, questions about personal experience, and questions about opinions were negatively correlated with achievement. Such results suggest that these questions are best categorized as outside the content to be covered and not representative of academically engaged time. Similarly, questions of opinion about a text (for example, "How do you think Mary felt?") may represent nonacademic questions."

Choral practice is often employed, especially in reading and language arts, in the elementary grades. We have found little research on its effects. It is reported as successful in the Oregon Direct Instruction Follow Through Program, one of the most successful of the Follow Through Programs (Rosenshine, 1982).

Pauses after questions have been shown to affect student responses. In a comprehensive six year study of what is termed teacher "wait-time," Rowe (1974) investigated the influence of the length of time the teacher pauses for a pupil response on the development of language and logic in elementary science students. By training, Rowe increased the mean "wait-time" from one second to three to five seconds. A second potential "wait-time" was the pause after a student response. Rowe found that teachers usually react or asks another question within 0.9 seconds (average).

The findings from an analysis of 900 tapes indicates that the quality of cognitive interaction improves in relation to increased pauses.

Increase in pause time, as tested by Rowe, influenced pupil responses in many ways. Student responses were longer (average shift from 7 to 28 words) and there was a greater number of student responses which were unsolicited but appropriate (average shift from a mean of 3 to a mean of 37). These behaviors were influenced by increases in both types of wait-time (wait-time 1 being the pause after asking a question, and wait-time 2 being the pause after a student response), but were more responsive to increases in wait-time 2. An increase in wait-time, particularly that of the first wait-time, led to fewer student failures to respond to a question. Children also appear to be more confident in their answers, as shown by vocal inflection, when responding under a slower schedule. Increases in both types of pause time led to an increase in speculative thinking with an average shift from a mean of 2 to a mean of 11 incidents. Students listen to each other more. Lengthening wait-time, particularly the second type, is associated with increased use of inference statements backed up by evidence. Increases in both wait-times resulted in more student-initiated questions and a greater number of experiments proposed by students, with a shift from a mean of 4 to a mean of 18. Slower students, who normally do not respond under a fast schedule, increase their contributions under a slower schedule. The types of student responses increase in variety with structuring, soliciting and reacting all showing greater incidence.

Increase in pause time also affected teacher performance in several ways. As pause time increased, teachers show greater response flexibility, as indicated by fewer mismatches between a student statement and a teacher reaction. Wait-time training resulted in teachers asking fewer questions per minute, decreasing from an average of between two and three questions per minute to approximately .4 questions per minute, and teachers using a wider variety of types of questions. Since teachers typcially give the best students more time to respond to questions, another influence of wait-time training is that wait-time becomes more equalized and teacher expectation for the slower children seems to change.

The study took into account and eliminated many variables such as (1) amount of teacher knowledge (2) size of the student group, (3) age of students (grades one through five included) (4) type of science program (5) amount of classroom materials, and (6) the pacing characteristics of various geographic areas because there was consistency in results, e.g., in suburban, urban and rural areas all over the country almost all teachers (197 in 200) pace instruction very fast, the teachers showed similar lack of science knowledge profiles and the patterns of questions and responses were remarkably alike.

A second potential wait-time is involved if the student does not respond when called upon to recite and the teacher repeats, rephrases, asks a different question or calls on another student.

Rowe (1974) and Borg (1969) have found similar short pauses in studies of high school populations (mean = 1.8 seconds) and Campbell (1973) in lower IQ junior high student population.

3.4 Concept: Teacher Treatment of Student Talk

Definition: Teacher treatment of student talk = the teacher responds to or acts upon student response by acknowledging, amplifying, discussing, or restating.

Indicators

3.4.1 Acknowledges a Student Response

Definition: Acknowledges a student response = teacher accepts a student response by recognition of the comment.

Example: (Pos) Ms. Suglia is discussing different ways to reduce friction. She demonstrates the principle by placing a book on round pencils and moving it along with little force.
Ms. Suglia: What we used to move the book are called roller bearings. Many common objects use roller bearings or ball bearings to reduce friction. Can you name some machines or vehicles that use bearings to reduce friction? Manuel?
Manuel: My bike has ball bearings.
Ms. Suglia: Okay. Let's list that on the board.

3.4.2 Probes or Amplifies Student Response

Definition: Probes or amplifies student response = teacher asks student to elaborate or justify his/her comment.

Example: (Pos) Ms. Goldberg: Yes, what exactly do you mean by "It was the author's intention to mislead you."

3.4.3 Restates Student Response

Definition: Restates student response = teacher modifies, rephrases, or applies a student response to redirect further discussion.

Examples: (Pos) Ms. Murphy: So you are saying that a moderate amount of exercise every day is better than a lot of exercise once in while.
Kino: Yes.
Ms. Murphy: Class, let's follow that line of thought. How could you find support for that statement?

3.4.4 Avoids Digression

Definition: Avoids digression = teacher does not respond to student questions or comments that digress from the learning task or could take the discussion to unrelated areas.

Example: (Pos) Mr. Santini's biology class is discussing how fish get oxygen to breathe.
Mr. Santini: What do you suppose happens when the fish opens his mouth--takes a mouthful of water into it--closes his mouth and pushes the water out through his gills? Why does he do that?
Willie: To get the oxygen out of the water.
Mr. Santini: To get the oxygen out of the water. Let's be more exact. To get the oxygen out of the . . .?
Luis: Air.
Mr. Santini: Air which is dissolved in the water. Sam?
Sam: Saturday we went to the city aquarium before the stock car races because they don't start until seven and we were there early. The aquarium has fish from all over the world. There was a whale shark which was supposed to be the largest living fish. Whales get larger than that though, don't they?
Mr. Santini: The whale is not a fish, remember. He is a good example of a water animal that does not breathe through gills. (Notice that Mr. Santini avoids the student question which is not related to the explanation of how fish breathe. He does respond to the student-initiated comment but uses the whale as a non-example.)

Principle

If the teacher acknowledges and amplifies student responses, uses their ideas, but organizes the lesson around the teacher's questions, and maintains academic focus, then learning is increased.

Supportive Evidence

Anderson et al (1979) found that teacher responses that include information about why the student answer is correct, such as rephrasing the explanation of why the answer is correct, or the steps or methods used to get the correct answer are helpful to other students who are in the process of learning the reasoning or steps in answering the question. In this study achievement gain is positively related to such use of student response.

In a review of 9 studies, Rosenshine (1971) and Dunkin and Biddle (1974) found positive correlations between using student ideas and achievement in eight of the studies.

Evertson et al (1980) in a study of 56 math and 75 English junior high school classes found support for receptivity to students' ideas, but they emphasize the need to consider this variable as interactive with others in increasing achievement and positive student attitude.

Soar (1966) used factor analysis to study teacher behavior in grades 3-6. Both simple acceptance and extended acceptance of a student's idea were positively correlated with student achievement.

In a study of 17 third grade science classrooms Wright and Nuthall (1977) found redirection of question asking to be significantly related to achievement, r = .54. Following a pupil response and his/her comment on that response, the effective teacher redirected the question to another student rather than asking further questions of the same pupil. Greater knowledge of subject matter was produced by involving more students in answering a question.

In studies of 60 classrooms of both high and low SES students in grades 3-8, Coker et al (1976) reported a strong relationship between pupil initiated substantive interchange and high gains in arithmetic for both high and low complexity tasks. In grades 3-8 there is a strong relationship between pupil's volunteering information and high reading gains on low complexity items for both high and low SES. And in grades 9-11, Coker et al (1976) found high correlation between pupil initiated substantive interchange and gains on high complexity reading items for both high and low SES pupils. Effective teachers of high SES pupils in fourth grade arithmetic permitted a high frequency of pupil initiated contacts which correlated with high gains in both high and low complexity arithmetic items according to Good and Grouws (1975).

Extensions/Exceptions

Soar (1973) in a study of 130 classrooms of low SES pupils in grades one and two found that more effective teachers make less use of pupil-initiated interaction than less effective teachers.

Soar (1973) also found that structured learning with the teacher related positively with gains in reading and arithmetic on high complexity items and related negatively with low complexity items for low SES pupils in primary grades. In a comparison of structured versus unstructured time for these students, strong positive relationships resulted from structuring for gains in reading and math on both high and low complexity items.

In low SES classes, Stallings and Kaskowitz (1974) reported that effective grade three teachers limit non-response pupil utterances and show a low frequency of nonacademic questions, requests, or commands. They provide a high frequency of academic verbal interaction.

Effective teachers of primary classrooms with both high and low SES pupils initiate more interchanges with pupils themselves rather than permitting pupil-initiated interchanges. Furthermore, they show a low frequency of allowing students to speak freely (Coker et al., 1976).

A number of studies support the idea that the focus of classroom interaction should be on subject matter controlled by the questions the teachers pose and the reactions they give in the development of the lesson. If teachers direct classroom activities without giving the students choices, approach the subject matter in a direct, business-like way, organize learning around questions they pose, and occupy the center of attention, then students show greater task orientation and greater gains in achievement, creativity, inquiry, writing ability, and self-esteem. (Good and Beckerman, 1978; Kounin and Doyle, 1975; Rosenshine 1971, Soar 1973; Solomon and Kendall, 1976; Stallings and Kaskowitz, 1972-73).

In summary, in a review of research on teachers of disadvantaged children, Medley (1977) found that effective teachers in the primary grades ask more low-level questions, ask fewer high-level questions, are less likely to amplify, discuss or use pupil answers, permit fewer pupil-initiated questions and comments and give less feedback on pupil questions. They spend less class time discussing matters unrelated to lesson content. In short, effective teachers are academically focused.

3.5 Concept: Teacher Academic Feedback

Definition: Teacher academic feedback = any expression, gesture or procedure that provides information to the student about the appropriateness of his/her response.

Indicators

3.5.1 Simple Positive Response

Definition: Simple positive response = teacher verbal or nonverbal behavior that signifies the student response is correct without elaboration.

Example: (Pos) Mr. Kelly: What is meant by straight thinking?
Lynn: Like during an emergency, knowing what to do.
Mr. Kelly: Yes, that would be some straight thinking.

3.5.2 Academic Praise

Definition: Academic praise = specific statements that give information about the value of the response or its implications.

Example: (Pos) Mr. Burns: Do you think the climate of Florida is in any way affected because it is surrounded on three sides by water?
Raphael: Yes, large bodies of water influence the climate making it more temperate. Extremes in temperature are more common in the interior than along the coasts because water warms up slower than land but water keeps its heat longer so there is less change in the weather.
Mr. Burns: That's an excellent analysis of the way water affects climate, Raphael. Your answer indicates that you understand the distinction between climate and weather, too.

3.5.3 Correctives

Definition: Correctives = the teacher provides an explanation of the error or gives a correction.

Example: (Pos) Ms. Chan: What is an isosceles triangle?
Carlos: It has 3 equal sides.
Ms. Chan: No, remember we said a triangle with three equal sides has a name from Latin meaning equal that sounds like equal. Do you remember it?
Carlos: Equilateral.
Ms. Chan: Good. So you have defined an equilateral triangle. Now, isosceles is a Greek word meaning equal legs. How many legs would it stand on?
Carlos: Two legs.
Ms. Chan: That is correct. Isosceles triangles have two equal sides (two legs). The third side, the base, may be longer or shorter than the legs. Carlos, draw a picture of an isosceles triangle on the board.

3.5.4 Redirects After Student Response

Definition: Redirects after student response = teacher asks a different student to answer the question or to react to the response.

Example: (Pos) Ms. Brown: Use the contraction "it's" in a sentence.
Scott: The kitten licked its paw.
Ms. Brown: Sylvester, what does the contraction "it's" mean?
Sylvester: It is.
Ms. Brown: Then, do you agree with the example, The kitten licked its paw?
Sylvester: No, its paw shows possession; it isn't a contraction.

Principle

If academic feedback is specific, evaluative, and/or provides corrective information, then achievement will increase.

Supportive Evidence

First of all what does research say about the kinds and amount of feedback given by teachers? In a study of teachers in grades 3 and 6, Zahorik (1968) found that there were in total 175 different types of feedback, but some types were used only once and others as much as 183 times. Variables affecting teacher feedback included grade level, lesson purpose, type of solicitation given, and quality or correctness of pupil response.

The more frequently used types of feedback were (1) repeating the pupil's answer approvingly and calling for or giving a new topic for discussion, (2) calling on the pupil to develop his response further, and (3) giving simple praise-confirmation and again moving the lesson along to a new topic. The sixteen types of frequently used feedback suggest a rather rigid dependence on simple positive feedback, response development feedback, and lesson development feedback.

The most-used types did not carry as much information as less-used types such as reasons or explanations as to why a comment had or lacked value, clues or prompts regarding what to do next to improve a response, and more elaborate praise or confirmation.

In a study of high school physics teachers, Pankratz (1967) found that effective teachers used praise or encouragement only one-half of one percent of class time or about 6 praise statements per 50 minute period. However the poorest teachers praised students only .0013 or about 1.3 praise statements per 50 minute period.

Dalton (1969) noted that in a natural classroom setting, students rated as high achievers by their teachers received 73% positive interactions as compared with 31% for the bottom group of students. From a review of literature Rosenthal (1971) says teachers show their expectations in the following ways:

1. They call on bright students more often
2. They ask bright students harder questions
3. They give bright students more time to respond
4. They do more prompting and shaping of answers from bright students.

What does research say about the effects of feedback? Anderson et al (1978) measured effective teacher behavior in first grade reading groups and found positive results for several specific variables that may be helpful if not overused, or if applied in appropriate classroom interaction context. Variables related to achievement included (1) minimizing call outs (2) using sustained feedback to correct student errors and to reduce initial failures to respond, (3) omitting feedback after correct answers (4) moderate use of praise (5) specific use of praise and (6) specific use of criticism.

In a study by Martin et al (1980) first grade students achieved more when (1) they had fewer responses terminated by the teacher giving them the answer, (2) they answered more questions correctly, and (3) they had fewer "failures to respond." Related to the student's relative standing within his/her group, lower achievement resulted from more feedback to incorrect answers in the form of criticism or terminal feedback. Sustaining feedback gave higher achievement.

In mastery learning studies corrective instruction correlated positively with achievement. Final achievement of the classes where learning of each task was corrected was much higher (80%) than the final achievement of the non-mastery classes (60%) when learning of each task was not corrected. Bloom (1976) estimates that the use of correctives accounts for approximately 25 percent of the achievement variance in a review of eight mastery learning studies at the elementary school level.

In a discussion of studies at the college level, Kulik and Kulik (Peterson, 1979) state there is little difference in the effect of correctives as to the form used, but the timing of correctives did increase achievement. Further, the remediation requirement that errors be corrected enhanced performance. Evidence from several studies supports the practice of correcting student errors early in the learning process. It is therefore important for teachers to check for comprehension as the lesson proceeds Emmer et al (1981).

Studies generally support the conclusion that criticism and negativism depress learning. In a compilation of studies Dunkin and Biddle (1974) and Rosenshine (1971) found thirteen studies out of sixteen yielded evidence that teachers who more frequently use criticism and disapproval tend to have students who do less well on achievement tests. There were negative correlations with achievement ranging from -.22 to -.61 in grades 1-10.

According to the findings in three studies, Anderson et al (1979); Stallings and Kaskovitz (1974) and Stallings et al (1979) optimal benefit from handling an incorrect student response occurs when the teacher helps students arrive at a correct answer by asking simple questions, providing cues to clarify the problem, or giving assistance with the process for working out the correct solution. Giving the student the correct answer and then moving to another student is not positively related to achievement gain.

In a functional analysis of verbal praise, Brophy (1981) defines praise statements as detailed expressions of positive teacher responses or evaluations of pupil responses that give information about the value of the response or its implications. This is more than simple affirmative feedback such as "good," "OK," or "right." Criticism connotes detailed negative reactions which also go beyond simple negative feedback about incorrect responses. From the analysis of numerous studies the following guidelines for effective praise are contrasted with ineffective praise:

Effective Praise

1. Is delivered contingently

2. Specifies the particulars of the accomplishment

3. Shows spontaneity, variety, and other signs of credibility; suggests clear attention to the student's accomplishment

4. Rewards attainment of specified performance criteria (which can include effort critieria however)

5. Provides information to students about their competence or the value of their accomplishments

6. Orients students towards better appreciation of their own task-related behavior and thinking about problem solving

7. Uses students' own prior accomplishments as the context for describing present accomplishments

8. Is given in recognition of noteworthy effort or success at difficult (for this student) tasks

9. Attributes success to effort and ability, implying that similar successes can be expected in the future

10. Fosters endogenous attributions (students believe that they expend effort on the task because they enjoy the task and/or want to develop task-relevant skills)

11. Focuses students' attention on their own task-relevant behavior

12. Fosters appreciation of and desirable attributions about task relevant behavior after the process is completed

Ineffective Praise

1. Is delivered randomly or unsystematically
2. Is restricted to global positive reactions
3. Shows a bland uniformity, which suggests a conditioned response made with minimal attention
4. Rewards mere participation, without consideration of performance processes or outcomes
5. Provides no information at all or gives students information about their status
6. Orients students toward comparing themselves with others and thinking about competing
7. Uses the accomplishments of peers as the context for describing students' present accomplishments
8. Is given without regard to the effort expended or the meaning of the accomplishment (for this student)
9. Attributes success to ability alone or to external factors such as luck or easy task
10. Fosters exogenous attributions (students believe that they expend effort on the task for external reasons--to please the teacher, win a competition or reward, etc.)
11. Focuses students' attention on the teacher as an external authority figure who is manipulating them
12. Intrudes into the ongoing process, distracting attention from task relevant behavior*

*Brophy, Jerre, "Teacher Praise: A Functional Analysis," Review of Educational Research, Spring 1981, p. 26. Copyright 1981, American Educational Research Association, Washington, D.C.

Exceptions/Extensions

In a study of types of teacher feedback used by effective teachers in grades 2 and 3, Mahaffey et al (1975) found different optimal approaches used by teachers or low SES versus high SES children.

Process feedback, defined as explaining by discussing the processes used to arrive at an answer, showed positive correlations with achievement for high SES children. In contrast process feedback in low SES classes showed weak but negative relationships. However, lack of feedback to correct answers showed positive correlations in low SES classes. This surprising result was thought to be related to curricular content. Since low SES teachers are working on basic tool skills, fast pacing uninterrupted by process feedback seemed to be appropriate.

Mahaffey et al's (1975) study of second and third grade effective teachers indicate that optimal feedback to incorrect student responses or no response depends upon the type of children being taught. In general, low SES teachers stayed with a child until he or she got the answer or improved an answer and did not go on to someone else who already knew the answer. The teachers provided clues or rephrased the question, supporting and encouraging the student to respond.

On the other hand, high SES teachers were likely to go on to another child if the original respondent did not answer correctly. The failure to respond correctly generally indicated a lack of knowledge rather than fear of responding. These children were eager and were likely to learn from listening to their classmates so it was important to get the right answer from any child. Brophy and Evertson (1974) also found correctives used by teachers who redirected the question to a different student, or who provided the correct answer, correlated positively .61 with reading achievement in high SES classes.

Abraham et al (1971) found that probing in grades one, six and eleven induced more pupil inferences and more accurate pupil inferences concerning subject matter in social studies and math. In white suburban classrooms probing lessons induced more observations concerning subject matter. However, in black ghetto classrooms nonprobing instructional techniques produced more observations concerning subject matter.

Rowe (1974) reported on an experimental problem-solving-science task. One group of students received overt verbal rewards from the teacher on a random schedule. The second group of students received reward for correct responses. The third group received no overt verbal rewards. Rowe concludes that in problem solving or inquiry situations, overt verbal rewards may distract students from the task and cause conflict between two motivational goals, because boys in group three prospered in the no reward situation whereas girls fared slightly better in group two with rewards. However, the problem solving efficiency of group one, which closely matched observed reward frequency in the classrooms, was significantly below the performance of the other two groups.

Brophy (1981) found that praise occurs relatively infrequently. Anderson et al., (1979) observed that teachers praise about 11% of their pupils' correct answers in first grade-reading-group recitation which means no child receives very much praise per day. But teachers do give more academic praise to high-expectation students than to low-expectation students even when opportunities to praise are taken into account, (Brophy and Good, 1970; Cooper and Baron, 1977; Heines and Hawthorne, 1978). Furthermore praise may be given inappropriately for incorrect answers or without specificity, thereby causing a lack of credibility as well. It is not surprising that praise does not correlate highly with greater achievement. Brophy summarizes as follows:

> In any case, it is only with low-SES/low-ability students in the early grades that praise seems to have genuine reinforcing effects on student learning. It is true that rates of praise of good student answers tend

to correlate weakly but positively with student learning in the upper elementary grades and in the junior high and high school grades (Evertson et al., 1980; Flanders, 1970). However, it appears that these correlations appear simply because praise of good student answers is part of a more fundamental teaching pattern involving concentration on classroom recitation and group discussion. Measures of time spent in these activities tend to correlate with achievement more strongly than praise rates do, and in general, process-product data suggest that structuring the classroom in order to elicit good student answers in the first place is far more important for producing achievement than praising those answers after they have been elicited. Teacher praise appears to have little or no causal role in its own right, at least in typical everyday classroom interactions (e.f. Brophy, 1979).*

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*Brophy, Jerre, "Teacher Praise: A Functional Analysis." *Review of Educational Reasearch*, Spring 1981, p. 16. Copyright 1981, American Educational Research Association, Washington, D.C.

3.6 Concept: Management of Seatwork/Homework

Definition: Management of seatwork/homework = teacher activities (verbal or non-verbal) that initiate and sustain the involvement of students in work at desks or tables or at home.

Indicators

3.6.1 Gives Seatwork or Homework Directions

Definition: Gives seatwork or homework directions = teacher talk that explicates procedures for independent practice of lesson content.

Example: (Pos) Mr. Peel gives directions for practice in a geography class by stating: Look at the skeleton map that I am holding. Notice that the rivers, lakes, highways, and forests have not been named. I will give each of you five of these maps. You are to locate sites where cities and towns are most likely to develop. First here is a sample map. Try locating on it some sites where towns or cities might be found.

Example: (Pos) Mr. Leonard: Now for tomorrow. On page 297 (text), you have a new idea. It says the equilateral triangle is met so often that we might as well have a little formula for it. It is proved there (page 297). Will you study the proof? Substitution, of course, and your formula--use it in solving number 1a, b, c, and d; number 2a; number 3, number 4, a and b, and that will give us enough practice. Now, start your homework and we'll see whether the assignment is clear.

At this point students begin doing homework and teacher helps students individually with the assignment.

3.6.2 Checks Comprehension of Seatwork/Homework

Definition: Checks comprehension of seatwork/homework = teacher performance to ascertain whether or not students understand what they are to do at seatwork.

Example: (Pos) Given the example in 3.6.1, Mr. Peel proceeds by asking students to locate one or more potential sites for a city and to state reasons for their selections. When the students are successful in doing so, they proceed with their seatwork by locating the most likely sites on each of five maps he has prepared for the class.

3.6.3 Sets Time for Checking Seatwork/Homework

Definition: Sets time for checking seatwork/homework = teacher utterances that alert students as to when their work will be assessed.

Example: (Pos) Ms. Anderson: Your seatwork will be checked at the end of the period (at beginning of the next class, etc.).

Example: (Pos) Mr. Clinker's history class has been asigned to do a project on the influence of labor organizations on the movement to establish public schools in the United States. The task has been analyzed into major elements by the class, each element being assigned a group of four students. The class has been given a week to do the relevant study and to organize their reports. The reports to be given orally on a specified day.

3.6.4 Teacher Mobility

Definition: Teacher mobility = teacher circulates about the room as students engage in seatwork and assists students who need help.

Example: (Pos) During seatwork, Mr. Peel moved about the room helping two or three students who have not fully understood the assignment or were otherwise having difficulty.

3.6.5 Holds Students Accountable and Gives Feedback.

Definition: Holds students accountable and gives feedback = teacher checks errors, or gives feedback, or grades seatwork or all of these.

Example: (Pos) Mr. Peel in 3.6.2 asks students at random to tell the sites they chose and their reasons. Then reasons are discussed and the answer decided upon.

Example: (Pos) Ms. Rodriguez: I'm returning your homework on common and proper nouns. Most of the papers were very good. If you have an "OK" mark, you may work with Ms. Nelson (teacher aide), on the Halloween story you are writing for the first grade. Remember to capitalize all proper nouns. Those who have a note on your paper to practice nouns will meet with me now at the Language Learning Center for another lesson on common and proper nouns.

Principle

If students understand what they are to do at seatwork and how they are to do it; and if the teacher monitors their work, provides corrective feedback, and holds them responsible, then learning will be enhanced.

Supportive Evidence

Seatwork typically involves practice exercises and its management requires that the teacher prepare the students to do the exercises, that the teacher give assistance when students encounter serious difficulties, and that students be held accountable for assigned work. Process-product studies have established the importance of seatwork, especially in elementary reading and mathematics and certain elements of language arts. Seatwork was found to be effective in second grade arithmetic, both low and high SES, when assignments are individualized (Coker and others, 1976, reviewed by Medley, 1977). In summarizing the behavior of effective teachers from his comprehensive review of the literature, Medley (1977) concludes "The effective teacher's pupils (in grades III and below) do spend more time in seatwork or 'independent study,' but their teachers behave differently during this time than ineffective teachers. For one thing, they spend more time checking individual pupil's work; for another, they are less perfunctory when they do so . . . . The general picture . . . is clear. When the effective teacher's pupils work independently, the teacher actively supervises them, giving careful attention to those individual children who, in the teacher's opinion, need it. The ineffective teacher who assigns pupils to seatwork leaves them pretty much to themselves; anyone who needs help must seek it."

A study by Good and Grouws (1977) in fourth grade arithmetic classes, indicates that effective teachers assign common seatwork exercises, respond to students when they need assistance, and give feedback. In addition, successful teachers provide clear directions about how to do the assigned exercises and what is to be learned.

The foregoing observations and suggestions are consistent with the findings of Brophy and Evertson (1976), in their study of some 68 teachers--30 teachers in one selected sample and 38 in a randomized sample constituting the comparative group. They state that effective teachers, in elementary grades, manage seatwork as follows: They give demonstrations to groups. Then they move around, encouraging students to try to demonstrate tasks. They then provide feedback to individuals according to their needs. Teachers who do not give demonstrations and individual feedback are less successful. It is important to recognize, as Brophy and Evertson emphasize, that it is not easy to detect whether students really understand a teacher's explanation of what they are to do at seatwork. Teachers must ask pointed questions, not just general queries such as "Do you understand?" "Is that clear?" "Any questions?"

Principle

If students are prepared in class for assigned homework so they understand how to do it, the assignments are short, students are held accountable, and corrective feedback is provided, then achievement can increase.

Supportive Evidence

Seventeen articles comparing the effects of homework with no homework appeared in the literature between 1900 and 1959 (Goldstein, 1960). Another survey for the period between 1900 and 1974 turned up thirteen studies in mathematics alone (Austin, 1974). Both reviewers concluded that these studies tended to support the practice of regularly assigned homework as a positive variable in achievement. The research is not conclusive, but no study showed a negative effect of homework on achievement.

While homework has been studied extensively, much of the early work is flawed because homework is often compared in effectiveness to other forms of study such as supervised study rather than to no homework. In addition, some of the experimental work was designed to test the influence of certain variables upon the effects of homework. Among these variables are voluntary homework compared to required homework, length of homework assignments, and effect of feedback. Furthermore, the kinds of homework often varied, with some exercises requiring practice, some problem solving, and some comprehension. Also, content control was often neglected resulting in studies that covered a variety of content. All these shortcomings indicate that research about homework should be taken with caution.

An early study by Vincent (1937) shows the homework group slightly superior to the group without homework, but not enough to convince him that homework should be required. Another study by Crawford and Carmichael (1937), involving grades 5-8 and covering a three year period, found the homework group slightly better in achievement, and according to a follow-up study, the group receiving no homework made lower achievement scores in high school. A more recent study by Koch (1965), confined to a single grade and subject--sixth grade arithmetic--and covering a period of ten weeks found a significant difference favoring the homework group in arithmetic concept achievement and no significant difference in problem solving.

Extensions/Exceptions

Martena (1969) made a study of homework in grade three, involving arithmetic computation, processes, and problem solving. Three groups of students were used; one was given no homework, another was given ordinary classroom homework, and the third was assigned a specified number of pages in the text. The treatments produced no significant differences. Gray and Allison (1971) made a study of the effect of homework on four computational skills and concepts with fractions involving sixth grade students. The experiment covered a period of eight weeks. Two groups were established randomly. One group was given three 20-minute homework assignments per week. The second group was assigned no homework. The treatments were reversed at the end of four weeks, each group thus receiving both treatments to control the influence of teaching styles. No significant differences attributable to treatment effects or teacher effects were found with respect to computational skills. The same held true for the effects of homework on comprehension of fraction concepts. No significant effects of homework on arithmetic achievement was found in two earlier studies by Cooke and Brown (1935), and by Teahan (1935).

A study of homework in the New York City elementary schools, by Di Napoli (1937), involved two schools in each of three different kinds of neighborhoods. In each neighborhood one school followed the practice of voluntary homework and the other required homework in grades 5 and 7. Some twelve hundred children were used in the study. Di Napoli concluded that "compulsory homework in the fifth grade, male and female, favors achievement as measured by a battery of standardized tests and there is a tendency for this difference to approach significance." And he concluded further that "Voluntary homework in the seventh grade, male and female, favors achievement--but the differences are so slight as to be insignificant."

The effect of teacher comments on homework in mathematics was studied by Austin (1976). A total of six teachers, five secondary and one elementary, participated in the experiment. Two hundred and twenty-two students, comprising nine classes, were involved in the six-week study. In each class students were divided randomly, some receiving comments on their papers and others no comments. The nine classes consisted of arithmetic (one class), general mathematics (three classes), Algebra I (four classes), and geometry (one class). The papers of both comment and no-comment groups were graded by indicating right and wrong problems and giving the paper a grade. In addition, the comment group received comments as follows: if a problem were missed, errors were indicated and corrections made by giving correct answers or showing how to solve the problem; if a clever solution were worked out, the teacher took note of it by an appropriate comment, if a student did not do as well as he or she should, in the teacher's opinion, the student was encouraged to do better. Classroom procedures were unchanged. In two classes--geometry and general mathematics--the comment group was significantly superior in achievement to the no-comment group. In no algebra class was the comment group better than the no-comment group. Comments appear to influence achievement in geometry and general math. A similar study by Schoen and Kreye (1974), showing that feedback has no influence on homework in mathematics courses for elementary teachers, tends to support the findings of Austin's study except for geometry.

Good and Grouws (1977) included homework as one of the key variables in their experimental program of mathematics teaching referred to early in the review of research on concept 3.2 where the experimental program was superior to the controls. Since homework is embedded in a set of variables constituting the experimental treatment, it is impossible to determine what the effect of the treatment would be without homework or the effects of homework as a single variable. After pointing out a number of misuses of homework, Good and Grouws suggest the following ways of handling homework:

1. At the very end of the math class period on Monday through Thursday, give a homework assignment which is due at the beginning of the class period the following day.

2. Each assignment should require about 15 minutes of outside class time. Within this time frame, assignments will probably average about eight problems per day depending on the kinds of problems being assigned.

3. The primary focus for an assignment should be on the major ideas discussed in class that day. Also each assignment given on Tuesday and Wednesday should include one or two review problems from the current week's work.

4. Each assignment given on Thursday should be primarily devoted to review problems from the current week's work. In order for sufficient practice to be given on the material discussed on Thursday, this assignment will be a bit longer than assignments for other days and will probably take about 20 minutes for most students to complete.

5. Typically, eash assignment should be scored (number correct) by another student. Papers should then be returned to their owners for brief examination. Finally, papers should be passed forward so that the scores can be recorded in the grade book.

6. The assignments given should be recorded daily in the Teacher's Log.

It is interesting to note that homework is combined with review, a practice that may enhance the effectiveness of both homework and review.

Principle

If practice exercises of appropriate length and spacing are provided and students are held accountable for on-task behavior, then learning will be enhanced.

Supportive Evidence

That practice induces learning needs no defense. The positive effects of practice are well known from common experience and professional wisdom as well as from research. The value of practice is embedded in the maxims: Practice makes perfect; we learn to do by doing. And one of the earliest theories of learning in modern psychology, that of Thorndike, included the law of exercise. However, there has been a tendency to associate practice with rote learning, drill on materials of little or no meaning, and with psychomotor behavior. But nowadays the term "practice" is used in a broader sense to designate not only repetitive activities but also exercises in complex operations such as composition exercises in written expression.

The effectiveness of practice is conditioned by at least three variables: length of the practice period, temporal distribution of practice, and nature of the material. The length of the practice period has received much attention from researchers. Generally speaking, less meaningful material requires shorter periods of practice. In learning to spell, for example, twenty-minute study periods will yield greater gains than eighty-minute periods (Hovland, 1938; McAustin, 1921; Pyle, 1913; Starch, 1927).

Distribution of practice, or spacing of practice periods, is also an important variable. If responses to materials or exercises are highly similar, as in learning addition combinations, distributed practice will be effective (Kappel, 1964). However, the influence of distributed practice is less when the materials are internally organized as in learning a complex concept by practicing with examples and non-examples. The less meaningful the material, the more likely that distributed practice will result in learning (Underwood, 1961).

In a study of the effect of structured practice on skill in written expression of first graders, Sullivan, Okada, and Niedermeyer (1971) found that experimental subjects were significantly superior to the controls. Their treatment provided for sequential practice on writing tasks, gradually increasing in complexity. In the beginning exercises, there were pictures and a two-page story with one or more words missing from each sentence. The student supplied the missing words from a list. In the next phase, the pages were increased to four and the students were asked to supply their own words to complete the story. Gradually entire sentences were missing from the story, and students supplied sentences to complete it. Finally, illustrations were given and the children wrote their own story. About 1200 first graders, representing 42 classes, made up the subjects of the study. The treatment program was included with the reading program in 14 classes of five schools. The remaining classes made up the controls.

The compositions from both controls and treatment classes were evaluated and scored by judges. The treatment classes were significantly better in the following ways: wrote longer stories, more sentences, fewer punctuation and spelling errors. The stories written by the treatment group were almost three times as long as those written by the controls. The time required to do the exercises ranged from 10 to 15 minutes per exercise.

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DOMAIN

4.0 PRESENTATION OF SUBJECT MATTER

1983

4.0 PRESENTATION OF SUBJECT MATTER

Definition: This domain = manipulation of the content of instruction to induce learning.

The domain includes the following named concepts:

4.1 Presentation of Interpretative (Conceptual) Knowledge

4.2 Presentation of Explanatory (Law or Law-Like) Knowledge

4.3 Presentation of Academic Rule Knowledge

4.4 Presentation of Value Knowledge

Overview

Teaching entails at least two types of performance: 1) interaction with students, and 2) manipulation of subject matter. A teacher may ask questions in a random order or in a set sequence; or a teacher may demand quick answers to questions or allow time for students to think. These are elements of instructional management. The teacher must also deal with subject matter: definitions (concepts), rules as in grammar and mathematics, laws as in natural science, law-like principles as in social studies, and value statements. These make up the basic elements of subject matter. Examples are as follows:

Definition: Water is an odorless, tasteless liquid composed of two parts hydrogen and one part oxygen; noun is the name of an object or event.

Rule: Begin a sentence with a capital letter; use a plus sign to indicate addition.

Law: If the temperature of a confined volume of gas is constant and pressure is applied, then the volume will vary inversely with the pressure.

Law-like Principle: If people are persecuted for their beliefs of whatever kind and there are ways to escape, they will flee to places where their beliefs will be tolerated.

Value Judgment: Guy DeMaupassant's The Wreck is a good short story.

In this domain of teaching we are concerned primarily with the presentation of definitions, laws, law-like principles, and values. These are found in almost every subject of the curriculum. And although their content varies from subject to subject, each has the same form and requires the same mode of analysis and instruction from one subject to another. For example, regardless of the school subject, concepts consist of a category (class or set) and attributes by which to tell whether or not an object belongs to the category. Laws or law-like principles always contain a set of conditions and a consequent that results from the conditions. Concepts and laws constitute powerful elements of knowledge and at the same time are among the most difficult to teach.

4.1 Concept: Presentation of Interpretative (Conceptual) Knowledge

Definition: Presentation of interpretative (conceptual) knowledge = teacher performance involved in analyzing and presenting information to facilitate the acquisition of concepts.

Indicators

4.1.1 Gives Definition Only

Definition: Gives definition only = teacher utterances that give the verbal meaning of pivotal terms when beginning a new topic or some new aspect of the current topic, no analysis or examples being given.

Example: In a discussion of the nervous system Ms. Jaco says, A dendron is a nerve fiber that carries the nerve impulse to the neurons.

4.1.2 Gives Example(s) Only

Definition: Gives example(s) only = teacher performance that names, describes, or depicts examples of a concept without giving either attributes or definition, or performance that induces students to do so.

Example: Discussing a passage in a novel Mr. Amazon says, What do we mean by moralizing? Then goes on to say, If I am talking, and I say, here is this man who has stolen a watch and is in jail and then I say that this just goes to show that theft is evil and leads to no good, I am moralizing.

4.1.3 Tests Example (rule-example)

Definition: Tests example = teacher performance that gives a definition and then names, describes or depicts examples that possess the attributes and examples that do not possess them or performance that induces students to do so.

Example: Mr. Urich, a sixth grade teacher (4.1.4 below), draws another triangle of different shape and size on the blackboard, calling attention to how it differs from and is also like the first. He then draws a variety of plane figures -- squares, different kinds of triangles, circles, parallelograms, etc.-- asking that the students tell which are triangles and which are not and why.

4.1.4 Identifies Attributes

Definition: Identifies attributes = teacher utterances or actions that give a category and identify the attributes for telling whether or not a given object or event belongs to the category or utterances or actions that induce students to do so.

Example: In a sixth grade class, Mr. Urich says, A triangle is a plane figure with three angles and three sides. He continues, Now this is a plane figure (draws triangle on chalkboard), for it has length and breadth but no depth. Note a, b, and c are angles and ab, bc, and ac are sides.

4.1.5 Distinguishes Related Concepts

Definition: Distinguishes related concepts = teacher performance that emphasizes attributes that separate members of a family of concepts (pardon, probation, parole; or taxes, tariffs, fees), or performance that encourages students to do so.

Example: Ms. Dobson says, We have been discussing imperialism and we see that it is the control of natural resources and world trade by dominating other nations often by the possession of colonies. Now, we often see colonialism mentioned in the media. What does colonialism mean?
Mary: A nation conquers other nations, usually undeveloped ones, and controls them for its advantage.
Ms. Dobson: Mary, that is a good way to state it. Now, how does it differ from imperialism.
John: It is part of imperialism. A nation can be imperialistic without colonies. It can dominate other nations, especially small and weak ones, by its economic power and subversive ideology without actually taking them over as Russia is doing in Cuba and some other countries.

4.1.6 Concept Induction

Definition: Concept induction = teacher performance that provides examples of a concept from which students infer the concept and its attributes.

Example: Ms. Glass draws different kinds of triangles on the chalkboard. She then asks the students, a sixth grade class, to point out the ways the figures are alike. She writes these on the board as they are pointed out. Then the students are asked to identify how they differ. From these observations the class constructs a definition of the figures and gives them the name - triangle.

Principle

If concepts are taught by providing definitions, examples and non-examples, and by identifying criterial attributes, then students are more likely to acquire complex concepts than if taught other ways.

Supportive Evidence

A study by Anderson (1972) shows that college students who are taught one sentence definitions of unfamiliar concepts are able to identify from the definition alone examples of the concept. The overall performance of the subjects was very high, indicating that students can learn concepts from definitions. It should be borne in mind, however, that the subjects of this experiment were undergraduate college students and experienced in concept learning. The results of this study should therefore be generalized with caution.

A study by Johnson and Stratton (1966) lends support to Anderson's findings. They studied five methods of teaching concepts: defining the concept, using it in a sentence, giving synonyms,classification, and a mixed method consisting of elements of each of the others. They found that students who were taught by the mixed method achieved higher total scores and that all method groups did better than the control group.

The foregoing studies appear to indicate that concepts are learned by stating them as definitions. But this procedure is not sufficient because, as Klausmeier (1976) has pointed out, the student may simply memorize the definition without understanding the concept. The possibility of this is obviated by the use of examples and non-examples which the student can classify if he has acquired the definition (Tennyson 1973).

Tennyson (1978), in a study involving college students, found that in learning the concept "trochaic meter" students who were given both definition and positive and negative examples did better than students who received the examples only. Feldman (1972) in a study with sixth grade students obtained the same results as those of Tennyson; namely, that the students did better when given both definitions and examples and non-examples than when they were given only examples.

The question of how many examples to use has also been studied. Frayer (1970) who found that students who were given a concept definition and four examples did just as well in concept learning as students who were given a concept definition and eight examples. This suggests that a few well chosen examples are just as effective as a larger number.

The choice of examples is an important matter. Examples are most effective if they differ widely in variable attributes. Non-examples are more effective if they exhibit a minimum number of criterial attributes (Klausmeier, 1976; Klausmeier, Ghatala, and Frayer, 1974; Tennyson, Woodley, and Merrill, 1972).

The absence of non-examples results in incomplete concept learning (Tennyson et al, 1972). This is the case even when examples are divergent and range from easy to difficult.

In the case of a family of concepts where two or more members of the family are coordinate (e.g., pardon, parole, probate), the research suggests that they be taught as single concepts using examples of one concept as non-examples of the others (Markle, 1977).

What can be concluded from the research? There is consistent support for the superiority of concept teaching by the general formula--definition with a few well chosen examples and non-examples. But it is also clear from the research that concepts can be taught in a number of other ways, although less effectively.

Extensions/Exceptions

In Piaget's operational phase of development--ages four to seven--children learn concepts informally as they acquire language and through experience with objects. They learn to classify objects by a single obvious feature and do not readily compare objects as to similarities and differences. At age seven and beyond students can classify objects into main and sub-categories such as boats + autos + airplanes = means of transportation. They begin to handle formal definitions and thus to learn concepts via definitions. Then it is appropriate to emphasize the acquisition of important concepts through the rule-example formula.

It should also be noted that some types of concepts are more difficult to learn than others (Clark 1971). Conjunctive concepts are easier to learn than disjunctive ones. For example, it is easier to learn that a dolman is a gold braided jacket, worn like a cape with sleeves hanging free than to learn that an out in baseball is three strikes, or caught fly, or thrown out at base, or tagged off base. Ratio concepts such as density in physics or social science are even more difficult to learn. And concepts for which there are no instances such as "force of attraction" in Newton's principle of gravitation are acquired only in the context of complex logical operations.

Medley (1977) reports from his survey of research on teacher competence that the discovery method--learning concepts by induction from examples--is negatively related to student achievement in reading for both low and high SES students in the second grade.

4.2 Concept: Presentation of Explanatory (Laws or Law-like Statements) Knowledge

Definition: Presentation of explanatory knowledge = teacher performance that relates an outcome or results to a condition; or teacher performance that states or elicits a statement of condition that causes or results in (brings about, produces, or other such expressions) another condition called an effect or consequence.

Indicators

4.2.1 Explicates the Cause

Definition: Explicates the cause = teacher performance that identifies and analyzes the cause(s), or performance that directs students in an analysis of the cause(s).

Example: Class is discussing crime and its causes. Mr. Boktar says, We have mentioned loss of identity, up-rooted people, and rapid transportation among the conditions that influence the crime rate. Now loss of identity is a very important cause. Can you give us some indication as to why that is so important? Liz?
Liz: There are so many people. So no one can find the criminals. They don't know who they are. Persons who can hide in a crowd are more likely to commit crimes.
T: That's good. It's easier to get lost in a large city. A city the size of New York City, or Chicago, Los Angeles, St. Louis, or any of our large cities in the United States--try to find a person who is--one has committed some crime. Unless you have some very good clues to go on, it would be almost impossible to find them, wouldn't it? But, when you have people coming to small towns and if they're strangers, it's very easy to keep track of them. And in small communities,

people know so much about what other people do; your neighbors know when you come and go, and there's very little opportunity for anonymity.

4.2.2 Explicates the Effect

Definition: Explicates the effect = teacher performance that identifies and analyzes the effect of conditions, or performance that directs students in an analysis of the effect.

Example: Mr. Boktar says: We have been discussing some of the causes of crime. We have said that crime is the result, or largely the result of certain conditions--loss of identity, rapid change and so on. Let us now look at the effect of these conditions. We call it crime. What are the different types of crime. The class then discusses different kinds of crime and the cost of crime to the society.

4.2.3 States Causal Principle, Using Linking Words

Definition: States causal principle, using linking words = activities which formulate, or involve students in formulating, the causal principle, using linking words to connect effect(s) to cause(s).

Example: Mr. Boktar makes the cause-effect relation explict when he says: If persons are in social circumstance where they lose identity, suffer poverty, and undergo rapid social change (and other conditions treated in the class), then the crime rate increases.

4.2.4 Applies a Causal Principle

Definition: Applies a causal principle = teacher directs students in using a principle (law or law-like statement) to solve a problem or to explain a known effect.

Example: A student says, I live on the beach and almost every night the wind changes direction about 1:30. When the direction is changing, the air is perfectly still and I get vey hot. Then the wind that has been coming from the water to the land reverses itself and blows from the land to the water. Why does it do that?

Mr. Fisher: That is a good question. Some time ago we studied about gases and their density. What principle did we learn that applies to this problem?

Sallie: Does it have something to do with the cooling of the land as compared to water?

Mr. Fisher: Yes, which cools faster and how does that affect air movement.

Sallie: The land holds less heat than water.

Mr. Fisher: Yes, John?

John: The specific heat of the land is lower than the water, or something like that. So the water gives off more heat and, I think, doesn't it, that the air over the water becomes warmer at night compared to the air over the land.

Mr. Fisher: What else?

John: Well, cold air is heavier and so the air moves toward the lighter, warmer air. Isn't that it?

Teacher: Well, yes, We haven't said it exactly. But that will do for now.

Principle

If teachers analyze causal conditions and their effects, then students are more likely to comprehend cause-effect relationships.

If teachers use linking words to connect the conditional part of a principle to the consequent part, then student achievement in explanatory content will be higher than if the connection is made with conjunctions such as "and" or, even less effective, not made at all.

If teachers make applications of laws or law-like principles, then student achievement in explanatory knowledge will increase.

Supportive Evidence

Research on the conduct of explanatory activities is sparse. Yet explanation comprises 20% of the cognitive demands made by teachers (Smith, et al, 1970).

Our search of the research literature on the teaching of causes has turned up very few studies and these describe teacher behavior without reference to its effect on achievement or other outcomes of instruction. Nevertheless, we have extracted from these studies three elements of teaching performance that seem to be inherent in the explicit teaching of causal knowledge. These elements are the identification and analysis of the causal conditions, the identification and analysis of the resulting conditions, typically referred to as the effect, and the formulation and application of explanatory principles that have embedded in them both the causal conditions and their effects. For example, if a person is infected by a malarial parasite, it follows that s/he will have fever, chills, and other symptoms. Infected by malarial parasite is a condition and the effects are fever, chills, and so on.

The notion of causation has many ramifications some of which go beyond the requirements of effective instruction and almost all of which are too involved for discussion here (Smith, Meux et al, 1970; Ennis, H., 1969). However, a few simple distinctions can be made.

First, reasons are to be distinguished from causes. The question, Why did America enter the First World War? may be answered by citing Wilson's speech asking for a declaration of war. He suggested that we go to war to make the world safe for democracy. This is not a statement of the cause of our entering the war but a partial justification of the decision to go to war. Or consider the question, Why did you buy a Michelin tire? The individual responds by saying, because they give better service over a longer period of time. Again the individual is giving a reason for his purchase. But if someone had said Mr. Jones has received many favorable reactions for his choice of tires and that these have influenced his choice, he would have been approaching a causal explanation of Jones' behavior. A clearer case of causation is found in the answer to the question, Why does the tire become more inflated after an extended tour? The causal answer is that the tire became hotter from road friction and that when the temperature is increased, the pressure of the air increases when the volume is held constant. Here we have a statement of a condition (temperature is increased and the volume of the air remains the same) and a statement of resulting condition (the pressure increases).

Anthropomorphic explanations are often confused with causal explanations. A teacher asks, "Why do wind-pollinated plants produce more pollen than insect-pollinated plants?" A student replies, "It is because they need to produce more pollen, since the wind wastes so much of their pollen." The student has attributed human characteristics to a type of plant as an explanation.

Teleological explanations are frequently given when causal explanations are required. For example, a teacher asks, "Why do people sweat?" A student replies, "Because it cools the body." The student cites an effect of sweating as its cause. When objectives, outcomes, purposes are used as explanations, teleology is involved.

It is important to distinguish normative explanations from causes, although the chances of confusion here are much less likely than in the preceding cases. A student says, "Why did the author use a comma in this sentence: Mary made a blue dress; Jane, a red one." The teacher replies, "We use a comma to indicate the omission of a word or words. The word 'made' is omitted after 'Jane'; so, we use a comma instead of the word." Normative explanations are used in teaching rules and are very important. They can be taught like causal principles, but should not be mistaken for them. (See Concept 4.3).

The problem of dealing with teleological and anthropomorphic explanations in science teaching, especially biology, has received some attention by Jungwirth (1975, 1979) and Bartov (1978). Jungwirth's (1979) study indicates that a high percentage of high school students tend to accept these types of explanations and to equate them with causal statements. Furthermore, high school students ordinarily are unable to distinguish teleological and anthropomorphic statements from scientific ones. Nevertheless, Bartov's study indicates that high school students can be taught to recognize and distinguish scientific causes from nonscientific ones.

Four types of causes should be noted:

Type 1. A relationship in which x is necessary and sufficient to produce y. Example: Polio virus is necessary and sufficient for an individual to become ill with polio; without the virus polio will not occur, and nothing else is necessary for the disease to occur (assuming no immunization).

Type 2. A relationship in which x is necessary but not sufficient to produce y. Example: An individual will not learn to judge weights if there is no feedback; feedback is necessary but is not sufficient. In addition, the individual must have experience in lifting weights of varying magnitudes.

Type 3. A relationship in which x is sufficient but unnecessary to produce y. Example: When labor cost increases, the price of what is produced rises. Labor-cost increase is sufficient to bring about price increases, but price increase can occur even when labor cost does not rise. In other words, rise in labor cost is not necessary for price increase.

Type 4. A relationship in which x contributes to production of y. Example: Competition among nations for natural resources helps to bring on war; but such competition is neither necessary nor sufficient to bring about war.

These distinctions in type of causes are usually not dealt with by teachers and this neglect probably results in much loose thinking of students and failure to grasp the structure of the concept of causation.

A study by Rosenshine (1971) shows a positive correlation between student academic achievement and the use of linking words by teachers when the object of the teacher's performance is to explain something. The explaining links--"consequently," "therefore," "thus," "in order to," and the like-- relate a phrase in one part of the sentence to that of another so that the connection between cause and effect, or premise and conclusion is more readily grasped.

Extensions/Exceptions

Children who are still in Piaget's operational phase of development--ages four to seven-- do not ordinarily think in terms of causal relationships in a systematic sense; that is, they do not relate cases to a general principle, but rather one case to another (Piaget, 1951). It is not expected that effective teachers of young children, say before about the age of ten, will exhibit a high frequence of linking expressions.

4.3 Concept: Presentation of Academic Rules

Definition: Presentation of academic rules = teacher behavior that facilitates the acquisition of rules and the ability to apply them.

Indicators

4.3.1 Describes the Situation

Definition: Describes the situation = teacher behavior that analyzes the kind of circumstances to which a rule is applicable.

Example: When two or more sentences are related as, for example, "It's a good car and you will like it," a semicolon can be used in place of "and." Example: It's a good car; you will like it.

4.3.2 Provides for Application (Practice)

Definition: Provides for application = teacher gives a number of situations to help students learn to apply the rule.

Example: In case of the rule in 4.3.1, the teacher provides a number of sentences, some to which the rule is applicable and some where it is not, to provide the students with experience in applying the rule.

Principle

If teachers direct students in using academic rules by describing rule circumstances and by providing rule practice, then students are more likely to comprehend rule situations.

Supportive Evidence

We have found little research on the teaching of academic rules. However, there is indirect evidence. Definitions are rules. They are rules for the use of words. The literature on the teaching of definitions, as we have just seen in 4.1, indicates that stating and explicating definitions, and giving examples and non-examples, is an effective procedure. Furthermore, Rosenshine's (1971) study supports the technique of "rule-example-rule." From this limited evidence it appears that an effective procedure for teaching academic rules, if not other rules, is to describe the specific condition to which the rule applies and then to provide exercises in applying the rule to similar conditions.

4.4 Concept: Presentation of Value Knowledge

Definition: Presentation of value knowledge = teacher performance that engages students in the use of criteria and factual evidence in the assessment of an object, event, or action (called the value object).

Indicators

4.4.1 States and Explores a Value Question

Definition: Identifies and analyzes a value question = teacher performance that specifies or that stimulates students to specify the event, action, conduct, or object to be evaluated and the evaluation term.

Example: Ms. Boswell says (in the course of teaching a poem), It seems it's society's nature to make individuals conform. It puts pressure on them to make them conform. Now, the pressure this society of hunchbacks puts on this person, a man who walks upright, was to jeer at him, and they did it to make him conform, and they knew it. But why--would you say? Why would a group jeer at a non-deformed person?
Walt: I don't know.
Ms. Boswell: If you can't say why it was, then was it fair? (The object to be evaluated is the behavior of people who try to make an individual--the upright man in this case--conform. The context had already been discussed. "Fair" is the evaluation term.)

4.4.2 Develops Criteria of Judgment

Definition: Develops criteria of judgment = teacher performance that states and discusses criteria, or performance that encourages students to state and discuss criteria, by which to value an object, event, etc.

Example: Ms. Boswell (from 4.4.1): If you can't say why it was, then was it fair?
Wanda: I don't think so.
Ms. Boswell: That's a judgment that you make. What is behind it? What does it mean to be fair?
Wanda: It means playing by the rules.
John: But what are the rules in this case?
Jim: I think one rule is that you don't treat a person differently from the way you would want to be treated.
Van: Is that always true? Are there not instances where it is fair to do something to a person and yet you would not want to be treated that way?
Ms. Boswell: Let's hold that question until we get more rules. Let's write that one on the board. Now, what other rules do you want to suggest?
Wanda: It's not fair to treat a person in ways that hurt him when he has no protection.
Sue: It isn't fair to judge someone only by the way s/he looks.
Jane: Should a person be blamed for something over which s/he has no control?
Van: The rule is that you don't criticize anyone for genetic defects.
(discussion continues until criteria are listed, analyzed, and possibly agreed upon)

4.4.3 Assembles the Facts

Definition: Assembles the facts = teacher performance that directs students in identifying and organizing the facts to be used in answering the value question.

Example: Continuing example in 4.4.1, Ms. Boswell says: We have now discussed and agreed, tentatively at least, on the criteria; that is, how we are to use the value word "fair." We

must now ask what facts indicate that the treatment of the upright man was fair or was not fair according to our rules.
Jim: Well, they jeered at him. That we know. But how did he react to that sort of thing? How would a normal person feel about the jeers of a society of deformed persons?
Wanda: We know that he stooped over to be like them.
Jim: But how did he feel? Was he ashamed of his uprightness? Was he humililated? Or did he just conform for convenience or what?
(The class continues to search for facts bearing on the application of the criteria until a value judgment is reached.)

4.4.4 Tests the Value Judgment

Definition: Tests the value judgment = teacher performance that directs students in deciding whether they can accept the criteria as a generalized principle of valuation.

Example: Ms. Boswell: Will our criteria apply to sports? A referee? A political speaker? Do we try to make them conform by jeering? If we do, is it fair according to our criteria? (the discussion continues by applying the criteria to each case to decide whether or not they fit)

Principle

If teachers perform in keeping with the schema of evaluation and are rigorous in treating criteria and their application, then students will likely learn to be systematic in considering value questions and more likely to reach defensible value judgments.

Supportive Evidence

Researchers have given relatively little attention to the problem of teaching value knowledge. Two approaches to the teaching of values have been studied: Values clarification (Raths, Harmin and Simon, 1966) and Moral Development Instruction (Kohlberg and Turiel, 1971). Twenty-five studies, 13 of value clarification and 12 of moral instruction, were reviewed by Lockwood (1978). The results of these reviews are not encouraging, especially for values clarification.

One of the purposes of values clarification is to help students acquire values to shape their conduct. The methods of instruction are varied but in general they are supposed to help students become aware of their values and to make such changes in them as their deliberations indicate. It is believed that students will thereby improve their self-concepts and become more positive and purposeful in their decisions and actions.

From his review of the literature, Lockwood (1978) concludes that most of the claims about values clarification have little to support them. He found no firm evidence that the values students hold are influenced by the methods and procedures of values clarification. These procedures do appear to have a positive influence on classroom conduct. But the claim that clarification of values has a positive impact on students' personal adjustment or self-esteem is at best dubious.

The moral development approach has as its objective the development of moral reasoning. A number of methods have been tried in this approach, the most prevalent being direct discussion of moral dilemmas and issues. This procedure engages students in such a way as to require them to clarify and justify their reasoning. The teacher typically tries to select moral problems that fall at the stage of development (Kohlberg's levels) just above the students' present level (Blatt and Kohlberg, 1975; Beck, Sullivan, and Taylor, 1972).

Lockwood's review (1978) suggests that the direct discussion procedure significantly accentuates development of moral reasoning.

A study of performance (Smith, Meux, and others, 1967, 1970) as teachers deal with value questions in the course of teaching English, history, social studies, and so on shows that a particular pattern of behavior is followed almost consistently, although unwittingly and partially. The pattern can be represented schematically as follows:

Value Object ______(rating)______ Value Term

Factual ____________ Criteria

It can be seen from this schema that a complete act of valuation requires that teachers identify the value object; identify and explicate the value term and provide criteria of its application; describe properties of the value object and make a rating. These elements make a structure of interrelated teaching activities. Each of these elements can be described as follows:

Consider the value judgement: X is a good knife. X is the value object. "Good" is the value term. Now, X is said to be a member of a set of objects called good. How do we decide whether it is a member or not. We formulate criteria for using the value term "good" in this particular case. Let us say the criteria we agree upon are:

1. Easy to sharpen
2. Holds sharpness well
3. Easy to open
4. Light weight
5. Has at least two blades - small and large

We now examine X (factual description) to see whether or not facts about X satisfy the criteria: It is easy to sharpen, etc. If the facts indicate that X satisfies the criteria, we feel justified in calling X a good knife.

The value object does not have to be an object in the every-day sense of the word, and indeed it is not usually so. The word "object" is here used as a very general term, with no restrictions on the range of entities that it can cover. The term "thing" is used in this general sense in some discussions. People, events, beliefs, actions, policies, practices, arguments, nations and so on can be evaluated. Anything that one can think of might well be evaluated in the classroom, although value objects will usually be concerned in some way with human beings and their actions. Furthermore, an object to be evaluated need not be one that is of great worth or one that embodies an obvious moral interest. The very pedestrian and humble can become value objects. The term "value objects" is used to indicate merely that the object has been selected for evaluation.

Value is to be distinguished from cherishing, liking, disliking, loving, hating, and other attitudes. Value is the worth we attribute to something. This land is worth 1,000 dollars a front foot. That is a statement of the land's value. Now, we might say, Yes, the land is worth that, but I do not like it; I wouldn't buy it even if I had plenty of money. To value something does not entail liking it. However, if we reject an object we value, we owe someone an explanation. If we say "X is a good teacher, but I would not employ him," the listener is entitled to ask "why." We must have some reason for rejecting what we value.

We usually indicate the sort of criteria we look for in determining value by normative words or phrases: words like "good," "bad," "fair," "right," "true," "reasonable," "correct," "worthwhile." There are various sorts of words that may involve teachers and students in a discussion of values because they carry a strong evaluative reference as well as descriptive reference. Terms such as "honesty," "corruption," "decadent" often serve as value terms of this sort.

It is of considerable interest to those who are concerned with moral matters to know the evaluative and ethical force of value terms, but in the present analysis more emphasis is placed upon the provision of criteria by consideration of the value term; that is, the criteria by which one knows when to say, for instance, that an object is good, an action is right, or a statement is true.

The description of relevant properties of the value object requires that a distinction be drawn between those properties an object has that are covered by the evaluative criteria and those that are not relevant to these criteria. Clear explication of the criteria is necessary if the student is to be able to provide, from such sources as texts or experience, a description of those properties of the object that are crucial in deciding its value.

The process of making a justified rating can now be characterized. The evaluator must know the particular object to be valued; understand the value term to be applied to the particular object; know the properties which are criterial for the value term; and know whether or not the particular object has the properties.

The justified rating process would then consist of a comparison of the criteria with the actual qualities of the particular value object, and an assignation of the value term to the object if it has the criterial properties or a withholding of the value terms if it lacks these properties.

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DOMAIN

5. COMMUNICATION: VERBAL AND NONVERBAL

1983

5.0 Communication: Verbal and Nonverbal

Definition: This domain = verbal and nonverbal teacher behavior that evokes and expresses information and personal relationships.

This behavior is grouped under the following named concepts:

5.1 Control of discourse

5.2 Emphasis

5.3 Task attraction and challenge

5.4 Speech

5.5 Body language

COMMUNICATION: VERBAL AND NONVERBAL

OVERVIEW

Knowledge is largely stored in language, notations, and symbols and is taught in and through language. Science, history, literature, and other subjects are largely embodied in language broadly conceived, and those who know the language can retrieve the knowledge of these disciplines.

Despite depreciation of language as an instructional medium by some pedagogical leaders in recent years, teaching is a verbal activity. With words we define, interpret, explain, describe, direct, question, praise, criticize, and counsel. Without words it would be next to impossible to teach anyone more than a few physical activities. The effects of establishing the meaning of one word between Helen Keller and her teacher dramatizes the importance of language in mental development.

The central role of language in our lives as well as in teaching highlights the fact that an important component of instructional competence is command of language. Recent research has consistently shown that teachers who have command of language, who speak clearly and succinctly, are more effective than those who speak vaguely or garble their discourse.

While command of language is crucial to successful teaching, that alone is not sufficient. There is also body language that reflects feelings and attitudes. Also the manner of speech and quality of voice can affect the reaction of students to instruction. While research is providing an increasing amount of evidence that these nonverbal forms of communication can play a significant part in determining the teacher's effectiveness, empirical support of nonverbal behavior as an effective component of teaching is not well established. Research falls short of demonstrating that such behavior markedly affects achievement. However, it does show that nonverbal behavior influences variables such as student perceptions of, and attitudes toward, the teacher which are presumed to affect achievement. But this presumption requires verification if it is to bear much weight.

5.1 Concept: Control of Discourse

Definition: Control of discourse: Teacher verbal control of information that increases the chances that students will comprehend what is said.

5.1.1. Connected Discourse

Definition: Connected discourse = thematically connected discourse that leads to at least one point.

Example: (Pos*) Ms. Pryor: We have discussed Malthus before. He had a theory that wars are inevitable; that there will always be wars because the population growth is going to continue at such a rate that countries will not be able to supply themselves with materials and food. Then when one country's population reaches the point of no return, we'll say, that country will go to war to take over the other countries so that it can increase its resources and production.

5.1.2. Scrambled Discourse

Definition: Scrambled discourse = discontinuous or garbled verbal behavior in which ideas are loosely associated.

Example: (Neg) Ms. Cox: Leonard Wood, who was a colonel at that particular time, and then who later on--he was regular army--and later, of course, became the brigadier general, and he's the man for whom Fort Leonard Wood, now, in Missouri, is named. Some of you boys, if you aren't familiar with Fort Leonard Wood now, you may be before too many more years have passed. The Rough Riders were probably the most colorful unit that took part in the war, and I think one of the reasons, probably, was the fact that it was Theodore Roosevelt who was one of their leaders. They fought along with these other--Army units around Santiago. Now the man who was in charge of the army was General Schafter and it was Sampson who was in charge of the Atlantic Fleet. Dewey had the Asiatic Fleet, as they called it at that time, and Sampson had the Atlantic Fleet, and Schley had a unit which they called the "Flying Squadron" of the Atlantic Fleet which came down around this part of the island and joined with Sampson as he came up there [points to map]. The serious fighting went on around the harbor, around the town of Santiago, and there were two battles in which the Americans distinguished themselves.

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*"Pos" indicates an example that has positive effects; "Neg" an example that has negative effects.

5.1.3. Vagueness Words

Definition: Vagueness words = words of everyday speech which teachers often use to describe, to present information, or to answer questions and for which the denotations are indeterminate (e.g., something, a little, some, much, few, things, you see, perhaps, actually).

Example: (Neg) In discussing Ellis Island the teacher says, Actually, when the government first started to use Ellis Island, I think it was about three miles square or something like that and that they have added tremendously to it until it is perhaps seven to maybe ten miles square at the present time--not square but would cover that much area. They have made a lot of it into something--to increase the size so they'd have more room to take care of these immigrants.

5.1.4. Question Overload

Definition: Question overload = teacher verbal performance in which long and involved questions or multiple questions are asked.

Example: (Neg) Well, remember the list of various levels of economic systems that I gave you? You know--people go out and gather up their things by hunting and fishing and then they start growing crops, and so on? At what level, in that development, do you think Europe was in--in 1850 or '60, in general? Were they all working on land that was owned by landowners? What's happening to Europe at this time?

5.1.5. Single Questions

Definition: Single questions = teacher asks direct questions one at a time without rephrasing or giving additional information.

Example: (Pos) Ms. Rivera: How many people know how to convert Fahrenheit degrees to celsius degrees? Raise your hands. . . . Okay, what is the rule that you follow to convert Fahrenheit to celsius? Moshe.
Moshe: You subtract 32 , multiply by 5 and divide by 9.
Ms. Rivera: That's right.

Principle

If teacher discourse is thematically connected, vague terms minimized, and questions are asked singly and exactly, then student achievement will increase.

Supportive Evidence

Much research has been done on clear teaching. Such teaching includes elements such as clear objectives and assignments. You will recall that these elements are treated in Domain 3. We are here concerned with discourse as it relates to clear teaching. A teacher's discourse can be clear yet the teaching unclear because the teacher fails to be specific enough in making an assignment, in showing how to work a problem in arithmetic, or for other reasons discussed in Domain 3. But vague discourse can permeate the whole process of instruction, rendering the operation of teaching confusing to the student.

Teaching is a form of verbal behavior. It is not surprising therefore that researchers have turned to the study of teacher discourse. One of the first lines of research was to explore the effect of vagueness on student achievement. Among the first pieces of research was that by Hiller, Fisher, and Kaess (1969). Working with experienced social studies teachers of senior classes they secured 15 minute lectures on two different topics--Yugoslavia and Thailand--32 on one topic and 23 on the other. From a study of these lectures they derived 9 vagueness categories as shown below:

Illustrated Vagueness Categories and Statistics

Category	Number of Items	Mean Number Occurring
1. Ambiguous designation (all of this, and things, somewhere, other people)	39	4.7
2. Negated intensifiers (not all, not many, not very)	48	1.2
3. Approximation (about as, almost, pretty much)	25	2.3
4. "Bluffing" and recovery (a long story short, anyway, as you all know, of course)	27	8.3
5. Error admission (excuse me, not sure, maybe I made an error)	14	1.3
6. Indeterminate quantification (a bunch, a couple, few, some)	18	10.3
7. Multiplicity (aspects, factors, sorts, kinds)	26	7.8
8. Possibility (may, might, chances are, could be)	17	8.0
9. Probability (probably, sometimes, ordinarily often, frequently)	19	2.0
	233	46.5

The vagueness terms found in the combined lectures and their frequency of occurrence are shown in the table below.

Most Frequently Occurring Vagueness Response
in Combined Yugoslav and Thailand Data

Response	Total Occurrences
Some	370
Many	179
Of Course	118
Things	108
A Little	102
Might	96
Few	84
Actually	83
Much	82
Something	75
Probably	74
As Far As	71
Perhaps	64
You See	58
May	57
In Fact	54
Maybe	53
Ok	53
You Know	52
Almost	48
Sort of ("Sorta")	44
Type of ("Typea")	42
The Rest	39
Somewhat	37
Seems	35
Various	32
Kind Of ("Kinds")	31
Several	31
Seem	29
Conditions	29
A Certain	26
Not Too	25
In Essence	24
And Other	23
And So On	23
Total	2351
Total of All Vagueness Responses	3503

Hiller et al. reported significant (p .05) negative correlations between the frequency of vagueness terms and student achievement. An independent study of teacher vagueness terms by Smith (1977) confirmed the work of Hiller and others. The results of these correlational studies have been confirmed by two experiments. Smith and Edmonds (1978) reported significant differences at the .05 level in favor of the group exposed to instruction with no vagueness words compared to the high vagueness group. In a subsequent experimental study Land and Smith (1979) confirmed the findings of Smith and Edmonds, claiming a causal relationship between teacher use of vagueness words and student achievement. The students taught through clear discourse (no vagueness terms) learned more than students taught through unclear discourse. The difference was statistically significant at p .05 level. The findings of Smith and Cotten (1980) in an experiment with 100 seventh grade students in mathematics further verify other studies that report high frequency of vagueness term is negatively associated with achievement. The vagueness main effect was significant, p .001 level. This study also lends weight to the findings by Smith and Land (1980) that high frequency of vagueness terms influences the way students perceive teachers--as disorganized, unprepared, and nervous.

In an earlier study by Solomon, Rosenberg, and Bezdek (1964), twenty four teachers of evening credit courses in Introductory American Government helped determine the relationship between teacher behavior and achievement. Pre and post multiple-choice tests of factual knowledge and comprehension tests requiring generalizations, applications and paraphrasing were analyzed with eight derived bipolar constructs of teacher behavior. The results indicated that Obscurity/Vagueness vs. Clarity/Expressiveness correlated significantly with factual gain, and with student ratings.

Some research suggests that teacher use of vagueness terms is related to the level of the teacher's knowledge. Hiller (1971) reports on an experiment showing that the less the teacher's knowledge the more frequent the use of vagueness terms.

We have found few studies of continuity in teacher discourse, but a number of studies of the effect of thematically connected discourse on recall of printed passages are reported in the literature. Pompi and Lachman (1967) showed that thematic passages were retained better than when the words of the passage were rearranged to alter the unity of the communication. A later study by De Villiers (1974) shows that connected passages are more readily recalled than disconnected passages.

While we cannot generalize from printed to spoken discourse without risk of error, the studies of vagueness referred to above suggest that continuity in spoken discourse may not be markedly different from printed discourse in its effect on learning. This suggestion is supported by the work of Thompson (1960). He prepared a ten-minute passage whose structure was evaluated by ten competent judges. The sentences were then randomly rearranged about each of eight points in the passage. A third passage was prepared by reordering randomly the sentences of the introduction, body, and conclusion of the discourse. Two hundred and seven college students, used as subjects, were grouped by their ability to organize ideas (Goyer Organization of Ideas Test), thereby controlling the ability to organize as a variable. The three communications were taped to control speaker variables. The findings of this study were summed up as follows:

> Subjects who listened to a better-structured communication consistently and significantly scored higher on the immediate retention test than did subjects who listened to a less well-structured communication. The same trend was observed in the delayed retention results as well, but the differences were not significant. Furthermore, when the organizational structure of the communication was controlled, subjects who had scored relatively high on the Goyer test consistently and significantly scored higher on both the immediate and delayed retention tests than did subjects who had scored relatively low on the Goyer test. Thus, both organizational structure and listeners' level of ability in organization appear to influence the retention of communication.

The work of Thompson lends strength to the findings of recent educational research on the effects of discontinuity. In two studies, one by Evans and Guymon (1978) and the other by Smith and Cotten (1980), it was found that discontinuity has a negative influence on student achievement. Evans and Guymon used a taped lecture by a teacher who repeatedly had been rated as below average on "clarity of explanation" as the unclear treatment. This lecture was reworked to the point of clarity and used as the clear treatment. Two factors were identified as separating clear from unclear treatment--use of examples and sequencing of points. The order of points in the reworked version was similar to the original lecture. But, in the original unclear lecture, the supporting information for any given point was not all presented in conjunction with the point. Both clear and unclear lectures were videotaped by a different teacher to control teacher variables. There were two treatment groups (clear and unclear lecture) and a control group. Those who received the clear lecture made higher scores than students who were given the unclear lecture, significant at $p<.05$ level. Smith and Cotten (1980), using seventh grade mathematics students as subjects, report from their experimental study that discontinuity was negatively related to achievement, significant at $<.01$ level. The findings of these researchers are further enhanced by the work of Kennedy, Cruickshank, Bush, and Myers (1978). In their study of student perceptions of clarity, they found that smooth movement from point to point in a lesson was associated with teacher clarity and that digressions or irrelevant intersections of information decreased clarity.

In a study of instruction in science concepts, Wright and Nuthall (1970) found a significant positive correlation ($r = .43$) between teachers asking single questions and achievement. Furthermore, teachers who asked two or more questions before getting a student response related negatively to achievement ($r = -.52$). The teacher may be trying to clarify but it must have been confusing to the learners who were trying to figure out what the teacher wanted. This interfered significantly with their learning.

5.2 Concept: Emphasis

Definition: Emphasis = instructional behavior that indicates to the student what is important in the subject matter to be studied.

Indicators

5.2.1 Marker Expressions

Definition: Marker expressions = teacher use of words (e.g., note this, this is the most important point) to indicate that to which the student should give special attention.

Example: (Pos) Teacher: What is a rhombus?
Student: It's a parallelogram with opposite sides equal.
Teacher: With opposite sides equal and one angle is 60 . But remember, and this is important, the parallelogram must also have oblique angles.

5.2.2 Marker Techniques

Definition: Marker techniques = teacher performance that uses underlining, colors, cartoons, etc., in presenting information.

Example: (Pos) In a spelling lesson, the teacher uses colored underscoring to note hard spots in words.

5.2.3 Repetition

Definition: Repetition = teacher performance in which the main points are restated at spaced intervals.

> Example: (Pos) Mr. Clark says, Now, there is one other point. We mentioned it earlier. We said that populations outgrow countries. Do populations outgrow the geographic limits of their country? . . . . .(two or three minutes of discussion follows) . . . . . Then Mr. Clark says, It was a man named Mathus who emphasized that there is no way to prevent the population of a country from growing to the point that it can no longer provide food for the people. The population thus out grows the country. . . . (more discussion, 4 or 5 minutes). . . Then Mr. Clark says, I wonder if Mathus were living today would he say that his theory of oversupply of people in a nation was sound. Are we reaching that point now?
> (underscoring indicates repetition)

Principle

If marker expressions and techniques are used and main points are repeated in spaced intervals, then students will be aware of important elements of content and achievement will be increased.

Supportive Evidence

An early experimental study on modes of emphasis in lecturing by Ehrensberger (1945) reports that the most effective mode is to use pro-active emphasis such as "now get this." Petri (1963), reporting on a review of six studies, concludes that the use of pro-active expressions, along with repetition, in lectures is one of the most effective ways of emphasizing what one wishes to have remembered. The effectiveness of these expressions in lectures has also been verified by Maddox and Hoole (1975). Pinney (1969) analyzed transcripts of classroom discourse of thirty-two experienced teachers in classes of 40-minute duration. The results showed that the frequency of marker expressions was consistently higher for teachers whose students were higher in achievement.

In a test of recall following a college lecture to ten groups of 253 students, Jersild (1928) found that the most effective form of emphasis is repetition, particularly distributed repetition. Repeating a statement twice in succession is not effective but repeating a statement three or more times in spaced intervals is effective. The most striking point in a discourse is the opening statement. After the first three statements the recency or last three statements are clearly better remembered than the middle statements. The most valuable of all the customary emphasis techniques is the use of verbal comments which direct attention to an item, such as "now get this" or "did you notice that?" Next in effectiveness comes the device of introducing a short pause.

In a study of verbal and nonverbal teaching behavior of 43 teacher-interns in grades K-6 Keith, et al. (1974) collected data on changes in student task-relevant behavior and misbehavior. One finding was that an increase in irrelevant pupil behavior tended to occur when teachers frequently used the blackboard. It appears that if we advocate the use of the blackboard as a positive emphatic technique, we must help teacher interns learn how to use this aid without creating a classroom management problem for him/her.

5.3 Concept: Task Attraction and Challenge

Definition: Task attraction and challenge = teacher behavior that motivates and challenges students to become task involved.

Indicators:

5.3.1 Task Attraction

Definition: Task attraction = behavior that expresses or shows genuine zest for a task.

Example: (Pos) Teacher makes a zealous statement, pointing out that the task or activity is especially exciting or attractive such as "This next exercise is going to be fun; I know you will enjoy it."

5.3.2. Challenge

Definition: Challenge = teacher makes a statement indicating to the students that an exercise or activity will be hard to do.

Example: (Pos) Teacher says challengely: "You are going to need your thinking cap on for this one. It's a real mind buster."

Principle

If the teacher is zestful and challenges the students when moving from one task to another, then the students become more work oriented and less disruptive.

Supportive Evidence

In Kounin's (1970) study of teacher behavior in elementary classrooms, the following results were obtained. Task attraction and challenge were positively associated with work involvement and reduced deviancy; correlations were low (.30 to .37) but significant statistically.

5.4 Concept: Teacher's Speech

Definition: Teacher's speech = voice characteristics that make up the auditory stimuli as distinguished from the content or message of the discourse.

Indicators

5.4.1 Loud, noisy, or grating voice

5.4.2 Shrill, piercing, highly pitched voice

5.4.3 Monotone--fails to vary the intensity, rate, and volume of speech.

5.4.4 Speaks too softly, almost inaudibly

Principle

If the teacher's speech characteristics including volume, pitch note, etc. are not extreme, then student achievement may not be adversely affected.

Supportive Evidence

Teacher's speech has several dimensions--volume, pitch, rate, intensity, etc. How these affect student comprehension and recall and attitudes toward the teacher has been investigated by a number of researchers. However, research in speech quality of teachers is in its infancy and the findings must be considered fragile.

Does rate of speech have an effect on students? In a study of second and third graders, Leeper and Thomas (1978) found that both boys and girls prefer to listen at the rate of 200 words per minute while boys tend to prefer slower rates than girls overall. But when comprehension is a factor, Carver (1973) found a threshold of 150 words per minute, for an average duration greater than .40 seconds per word, favored comprehension. When the rate increased and the average amount of time allowed to process each word dropped below .40 seconds, the percentage of understanding dropped abruptly.

In a study by McCoard (1944) involving forty teachers, fourteen audible speech factors (general effectiveness .32; communication of ideas .29; communication of emotion .37; distinctness/pronunciation .25; pitch .36; pitch variation .42; quality .32; quality variation .40; volume .38; volume variation. 37; rate .32; rate variation .37; phrasing .28; phrasing variation .33) were correlated with teaching criterion scores. All but three scores were significant positive correlations, and the highest scores were for voice variations. Variations as in pitch, quality, rate, volume and phrasing seem to show good teachers use more variety in speech than do poor teachers. Pupil gain scores were used to divide the forty teachers into thirds called "good," "average" and "poor." The same classifications were made according to speech scores and the percentages were analyzed. Good teachers as a group were shown to have significantly better speech than average or poor teachers.

The author concludes that although a significant positive relationship does exist between speech ability and teaching efficiency as measured, the correlation is not high enough to warrant the use of any single factor or total of speech factors as an index of teaching ability. Speech ability is made up of interrelated, interdependent factors so the judgment of speech effectiveness by trained judges seems to be in terms of its whole effect.

In a study by Diehl and McDonald (1956), it was found that two voice qualities negatively affect test scores on the lecture content. This was an experimental study to determine the extent that the quality of a speaker's voice--nasality and breathiness--interferes with ability to communicate information. The nasality group was significantly different from the control group at the .05 level of confidence and the breathiness group differed significantly at the .001 level of confidence. The subjects also rated the extent that the quality of the speaker's voice affected them. The voice free from defects was rated "very good" while nasal voice, breathy voice and harsh voice were "average" and hoarse voice was called "poor."

Extensions and Exceptions

In a study of pitch change and comprehension by Diehl, White, and Satz (1961), involving college students, pitch variation did not show significant difference in a comprehension test on lecture content. However, it did have a significant effect on the ratings of the speaker's delivery. Lectures with changes in pitch inflection and interval were rated very good or good while those lectures with the same content but pitch changes eliminated were rated close to poor.

A study to determine the effects of speaker's sex and four speech variables (rate, pitch variety, voice quality and articulation) on three dimensions of speaker credibility (competence, trustworthiness and dynamism) by Addington (1971), found voice variations to be the significant factor and not speaker sex. The competence dimension was associated with the widest range of means suggesting that it was the most sensitive to changes in the sound of the voice. Differences in speech rate had no significant effect on speaker credibility. Increases in pitch variety were insignificant, but decreases in pitch variety (monotone) were related to substantially lower ratings. Voice quality differences caused many rating differences. The normal sample was rated significantly more dynamic than the denasal or throaty samples, more competent than all but the orotund samples, and more trustworthy than the nasal, tense, denasal and throaty sample. Throatiness was rated as the least credible voice quality. Articulation was the most uniformly effective speech variable in altering credibility ratings. The faulty articulation sample differed significantly from the normal sample on all three credibility dimensions.

A study by Burgoon (1979) to measure effectiveness of prospective newsbroadcasters identified a number of vocal attributes that were perceived as predictors of speaker credibility. Ninety-six students in an introductory communication course (4 classes) were used as subjects. Speakers were rated more competent and composed if their speech was perceived as more fluent, more pleasant, clearer and slower. Pleasant was defined in terms of voice quality and articulation in addition to fluency. Pleasantness plus pitch variety were significant predictors of speaker character-sociability. Pitch variety and rate were significant predictors of extroversion and fluency and loudness approached significance.

5.5 Concept: Body Language

Definition: Body language = teacher's facial or other body behavior that expresses interest, excitement, joy, and positive personal relations or boredom, sadness, dissatisfaction, or negative personal relations, or else, no clear message at all.

Indicators

5.5.1 Teacher Smiles

Definition: Teacher smiles = facial expressions, including eyes, that give feedback about the teacher's positive affective state--pleasure, friendliness, interest, excitement, surprise.

5.5.2 Deadpan Expression

Definition: Deadpan expression = expressionless face; teacher's feelings not easily discernible, or else completely hidden.

5.5.3 Teacher Frowns

Definition: Teacher frowns = facial expressions that give feedback about the teacher's negative affective state--displeasure, disapproval, anger, etc.

5.5.4 Posture and Movement

Definition: Posture and movement = teacher's stance and movement that indicates teacher's energy and enthusiasm.

5.5.5 Eye Contact

Definition: Eye contact = teacher looks at students steadily and intensely without glaring, suspiciousness, or anger

Principle

If the teacher demonstrates positive non-verbal (body) communication, , then students react favorably and achievement may be increased.

Supportive Evidence

Empirical evidence in support of the effect of bodily expression or nonverbal behavior on achievement is sparse. Much of the research has been done in non-school settings and is experimental rather than process-product in design. Furthermore, lack of precise descriptions of nonverbal variables in research reports often leaves the reader uncertain about what is observed or measured. Nevertheless, the exploratory studies summarized here should be taken seriously but critically, for nonverbal aspects of teacher performance are always present as instruction proceeds and research that calls attention to them by providing even qualified evidence of their influence is not to be ignored.

In an experimental study involving 20 classes--7 sixth grade and 13 seventh grade classes--comprising a total of 561 students, Mastin (1963) found that teacher enthusiasm has positive influence on both student learning and attitudes and that student intelligence does not affect significantly the reaction of students to either teacher enthusiasm or indifference. The teachers presented an illustated lesson in such a way as to show indifference. A week later the same teachers presented similar lessons on a different subject, under similar conditions, in a manner to show enthusiasm. One lesson was on ancient Egypt and one on ancient Rome and Pompeii.

The features of teacher behavior for both indifferent and enthusiastic performance were evaluated by a group of competent judges and by the experimenter. Content tests and the same attitude scale were administered after each lesson. Reading ability was controlled by reading test questions and optional answers were read to the students. The same procedure was followed for the attitude scale. There were four sequences for the two lessons and two types of presentation--enthusiasm and indifference. Each series was repeated five times.

It was found that the mean of the classes taught with enthusiasm was higher in 19 of the 20 classes. In 15 classes, the difference was significant at the one percent level. In only one class did the data show a significant difference favorable to the indifferent lessons. The attitude of students in the enthusiastic classes was on the whole favorable and significant.

Gunderson and Hopper (1977) investigated the effect of speech delivery--gestures, posture, body movement, and persuasiveness--on recall and comprehension. Although no significant differences were found for recall-comprehension of a persuasive speech on the subject of standards for antipollution devices, college undergraduates were significantly affected by the speech composition as measured by a pre- and posttest of attitude change and their assessment of speaker objectivity. The speech composition and its delivery which included voice quality, volume and rate, as well as nonverbal factors (gestures, posture and body movement) significantly affected the listeners' ratings of speaker dynamism, professionalism, trustworthiness, and their overall rating of effectiveness.

In a study by Coats and Smidchens (1966) on the influence of speaker dynamism on recall it was found that the only significant variable was the mode of presentation. Students in undergraduate speech classes remembered much more from the dynamic presentations which were delivered from memory with much vocal inflection, gesturing, eye contact and animation. Grade threat, the person doing the lecturing, and static delivery did not increase lecture recall.

Using the Mary Lynn Collins Training program (1977), on gesturing, facial expressions, vocal delivery, word usage, etc., several studies have reported raising the level of teacher enthusiasm with varying student effects. Gillett (1980) studied elementary teachers who taught mathematics lessons (pretraining vs. posttraining). The experimental group increased significantly in at-task behavior while control group students decreased in at-task behavior. The difference between the two groups was statistically significant. Student at-task behavior was further divided into "direct teacher attention" (primarily teacher exposition) and "indirect teacher influence" (primarily seatwork). Under both direct teacher attention and indirect teacher influence, the experimental group's at-task behavior increased significantly from 75% to 86%. The control group students increased at-task behavior slightly under direct teacher attention but decreased under indirect teacher influence from pretraining to posttraining.

Allen (1981) using the Collins program determined the relationship between teacher enthusiasm and five student factors; namely, student interest in school, interest in subject, achievement motivation, attendance and how they felt about their instructor. Five hundred forty-seven students in forty-three vocational classes were evaluated and the only factor which exhibited a significant relationship with teacher enthusiasm was the students ratings of their vocational teachers.

Bettencourt (1979) in a study of fourth, fifth and sixth grade classes determined the effects of enthusiasm training on student achievement and attitudes. Experimental group teachers significantly improved their observed level of enthusiasm while control group teachers did not differ after the training period. Students in both groups made significant gains and there was no significant difference between test scores of experimetnal and control group students. Experimental group students did score slightly higher than the control group students on the attitude scales but the difference was not statistically significant.

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